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Corrections/Clarifications:

The June 1999 article "Decipher Connection Speeds" included incorrect numbers for measuring transfer rates. Transfer rates are measured in kilobytes per second (KBps). If you have a 56 kilobits per second (Kbps) modem, you should expect top transfer rates of about 4.3 KBps.

The June 1999 article "Schwab.com Makes The Trade" did not include information on minimum account balances or costs per trade. Customers must invest at least \$2,500 to open a Schwab.com account, and Schwab.com charges \$29.95 per trade up to 1,000 shares and 3 cents per share for further trades.

Customer Service

customer.service@smartcomputing.com
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Editorial Staff
editor@smartcomputing.com
FAX: (402) 479-2104
131 W. Grand Drive
Lincoln, NE 68521

Advertising Staff
(800) 848-1478
120 W. Harvest Dr.
Lincoln, NE 68521
FAX: (402) 479-2193



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PUBLISHING

Editorial Staff: Ronald D. Kobler / Trevor Meers / Corey Rusanian / Meredith Witulski / Kimberly Pitzke / Michelle Cameron / Dan Spillerberg / Tom Mainelli / Samit G. Choudhury / Katie Dokin / Eileen Demott / Jennie Muench / Michael Sweet / Buffy Cranford-Petelle / John Labande / Christopher Trumble / Blaine Fleming / Marty Sims / Chad Denton / Lori Robeson / Michelle Nelson
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About The Site ...

If you're looking for a comprehensive computing reference, look no further than the *Smart Computing* World Wide Web site. Our searchable site provides the complete text of issues available on newsstands, plus previews of upcoming issues. The archive includes articles from past issues of *Smart Computing* and the popular *Guide* and *Learning Series*. Check in regularly; new information is added daily.



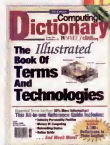
Tip Of The Month: Hardware Reviews — Before you go out and buy that new piece of hardware, check out our reviews to see how it performed in our tests. Head to the "Find Products" section on the home page and click the Hardware Reviews link. You can select a category and subcategory or use the handy keyword search feature to reach a list of our reviews. The list of results will include both standalone reviews and head-to-head comparative reviews. Be sure to check the dates of the reviews to make sure you are seeing the most recent test results. Check back often, as we add new reviews daily.

Upcoming Issues ...

PC Novice Guide Series:
The Web's Hidden Treasures
Hundreds of tips for finding bargains online.



PC Novice Learning Series:
Internet Tips & Tricks
How to make your time online more productive.



Reference Series:
Computing Dictionary (Fourth Edition)
Definitions of computing and technology terms.



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BENEATH ITS SMARTLY TAILORED EXTERIOR, THE INTRIQUE NOW BOASTS AN AWARD-WINNING 215 HORSEPOWER V8, GIVING THIS ALREADY NIMBLE PERFORMER A PERFECT BALANCE OF POWER AND AGILITY. JUST ASK WARD'S AUTO WORLD, WHICH NAMED THE 3.5-LITER TWIN-CAM V8 ONE OF THE TEN BEST ENGINES OF 1999.

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Touring Virtual Worlds

While current virtual reality tours offer Web users a glimpse into a real building or facility's layout and design, the best online exploration tends to serve only as a tool for surfers to familiarize themselves with a building or area's most basic features. Related information on the real-life location may be available, but many of the services and other extras offered at the actual locations, known as "brick-and-mortar" facilities, are hard to duplicate. For example, no matter how good the virtual reality, you usually can't go into a store and pick up items as you might in a real boutique.

Several new Web sites are working to destroy those limitations and

expand the possibilities of what you can experience through virtual reality. These sites are increasing the number of things you can see and do on the Web, as well as the number of products and services you can access.

The virtual reality tour of the Austin-Bergstrom International Airport at <http://www.ci.austin.tx.us/newairport/vrt.htm> presents users with a photo-realistic reproduction of the actual airport, complete with furniture, lighting, artwork, and signs. The tour lets visitors explore the fully interactive site in a 360-degree viewing environment. The site offers relatively fast downloads, with each view taking



from 30- to 45-seconds to download using a 28.8 kilobits per second modem.

Online visitors can wander through the airport and use the services of several airlines, car rental agencies, and more than 20 shops and restaurants. Customers can order plane tickets or reserve car rentals at the virtual agency counter of their choice, buy items from the shelves of the various shops, and even peruse the menu at a restaurant, all without setting foot in the actual facility in Texas.

A virtual airport is interesting, but if you like your high tech with a splash of culture, point your browser to the virtual reality art museum called ArtMuseum.net at <http://www.artmuseum.net>. The site presented by Intel offers access to virtual reality art displays and a wealth of art-related information.

In addition to being a place to view pretty pictures and various current exhibitions, ArtMuseum.net also provides three-dimensional viewing of specific exhibitions shot in the actual museum hall.

ArtMuseum.net is currently presenting a collection of 20th century American art in conjunction with the real-life exhibit at the Whitney Museum in New York City (<http://www.whitney.org>) called "The American Century: Art & Culture 1900-2000."

If these two virtual tours are any indication, the gap between the digital and real-life worlds will continue to decrease as more sites offer services and extras in a virtual reality setting that mirrors the real thing. ■

Online Window Shopping

Computer hardware, software

29% Shopped Online

37% Bought Online

Home office products

18%

5%

VCR, DVD or camcorder

12%

2%

Videogame hardware or software

11%

5%

Cellular phones or pagers

11%

0%

Home stereo products

10%

2%

ACCORDING TO A Consumer Electronics Manufacturers Association (<http://www.cemacity.org>) study, nearly 30% of those who buy electronic products online plan to spend twice as much next year online as they did in 1999. At present, however, more folks are browsing than buying.

Finding A Misplaced Family Member

Using technology originally designed to locate stolen vehicles, two developers are working to create a way to help people keep track of people.

Bill Brown and Dan Brooker, founders of Protect Me Toys, have designed a system called SatCel that is small enough to fit in a person's backpack or fanny pack and uses global positioning satellite (GPS) technology to allow others to track that person. Brown and Brooker say they designed the system to keep track of youngsters, but the concerned individual can also use it to track other wandering loved ones, too.

The SatCel device contains a GPS card that Canadian Marconi Co. (<http://www.marconi.ca>) originally designed for Boeing jets. Redesigned for increased sensitivity, the business card-sized unit was merged with a cellular phone receiver and antenna. In all, the device weighs about 1.5 pounds.

To preserve battery life, the device remains inactive in the person's backpack until needed. If someone decides to track the unit's location, they contact a central tracking agency. The agency then locates the position of the SatCel. The tracking agency silently calls the SatCel and can locate the unit anywhere cell phone coverage is available.

Monthly activation fees should be low, around \$5, while the unit itself will sell for around \$200. Plans for modifying the unit include reducing its size enough so concerned parents or friends can sew it into clothing or attach it to a person's shoe. Also, if all goes well, someday you'll be able to track the ones you love from your home computer. ■



Cartoon Technology Coming Soon

A real-life version of a certain two-dimensional detective's famous television wrist-watch may reach the hands and wrists of consumers in the not-too-distant future.

Currently in development by researchers at Bell Laboratories (<http://www.bell-labs.com>) and Lucent Technologies (<http://www.lucnet.com>), the new watch will include features found in many other portable wireless devices, such as voice recognition, video capabilities, and possibly a built-in microphone and a single-chip radio. Oh, and it also keeps the time

Using a process known as micromachining, researchers at Bell and Lucent have already successfully constructed a microphone on a 0.1 millimeter silicon chip. Meanwhile, researchers continue to work on a viable single-chip radio that could open a world of miniaturized communication possibilities.

Once researchers work out the final bugs, the applications for such a device seem almost endless (they could even surpass the possibilities imagined in the famous comic strip). Both business and home consumers could find communication and entertainment uses for the device, and it could also fill a variety of emergency needs.

Dick Tracy, eat your heart out. ■

Tech Shorts

A NEW DEVICE from Online Anywhere (<http://www.onlineanywhere.com>) and Vetronix Corp. (<http://www.vetronix.com>) lets drivers surf the Web without taking their eyes off the road. Combining voice-recognition technology with software and communications hardware, the unit lets users access the Internet through the Auto PC platform (based on Microsoft's CE operating system). The product should enter beta testing in late 1999.

One downside to using fingerprint biometric security devices (a technology that verifies an individual's identity based on personal fingerprints) is that oil, dirt, or other materials can cause malfunctions. AuthenTec (<http://www.auhtentec.com>) overcomes this drawback using its E-Field Technology, which scans the live epidermal layer of skin instead of relying on the

fingerprint patterns found on the surface. This eliminates interference from surface materials and other environmental conditions and offers a more reliable reading.

The new top-level Internet domain designation .md is now available, and users are snapping up the available Web addresses (which appear something like this: <http://www.yoursite.md>). Everybody from medical professionals to Maryland residents is grabbing the new Internet real estate, which is offered through the company Domain Name Trust, Inc. (<http://www.domainmart.md>) and joins other common top-level names such as .com (commercial), .org (nonprofit organization), and .edu (education). Company officials say more than a million addresses in the .md domain should be active by 2003. ■

The Voice Of SAFTy

Data security has always been important to organizations. Now, with the ensuing dependence on personal computers, security for desktop PCs is a major issue for individuals, as well. PC users have plenty of security options, including the recently released SAFTyLatch 1.0, a voice-recognition security program from SAFLINK Corp.

Once you've enrolled (programmed it to recognize your voice patterns), use SAFTyLatch to secure folders and files on your hard drive and removable disks so that only authorized users can access these items. (As a precaution, SAFTyLatch prevents users from securing certain important system folders.)

SAFTyLatch easily passed our tests and proved to be a reliable form of desktop security. The entire process of

enrollment took less than five minutes. After initially entering our voice password, we simply started each computing session by speaking the password to gain access to all of the protected folders and files on our PC.

During the enrollment process, we also created a SAFTyKey file, which allows users to type in a password to access secured folders in the event of laryngitis or a bad cold when a user's voice is unavailable.

Securing our folders was simple. Each folder is clearly marked and appears empty to unauthorized users who attempt to access them. We also were pleased to find that when we

checked the folders we secured on removable storage media, such as diskettes and Zip disks, the items remained protected—even when the disks and diskettes were opened on other computers.

Anyone who shares a PC with other users should consider a **biometric** (based on physical traits, such as voice patterns, facial features, or fingerprints, rather than digital code) security solution, such as SAFTyLatch,

to protect important data. At the low price of \$59.98, which includes a microphone and a SAFTyKey diskette, SAFTyLatch is a quality, affordable security solution.



Securing your data with SAFTyLatch is as easy as saying, "My voice is my password."

SAFLINK Corp.

SAFTyLatch 1.0
(800) 762-9595

(813) 636-0099
<http://www.saflink.com>

Gain Guitar Skills Through Song

Guitar purists may cringe at a product like eMedia Guitar Songs, but there are plenty of would-be strummers who could learn a thing or two from this teach-your-

self application.

These interactive guitar lessons guide users through 21 popular guitar songs, including "Baby, I Love Your Way," "Bad, Bad Leroy Brown," "Oye Como Va," and "Take Me To The River." The program displays each song in note-by-note, strum-by-strum detail. The program also includes a complete audio soundtrack so users can listen to the songs while they practice. Additionally,

an on-screen animated fretboard illustrates the fingering of each chord and note. The program also features a tuner, a metronome, a glossary of guitar terms, and a tablature that users can print out so they can practice playing the guitar when they're away from their PCs.

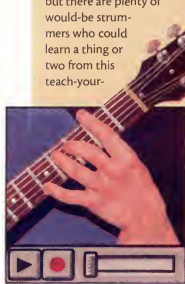
This program can teach users how to play the target 21 songs, but it's not supposed to teach users everything about playing guitars. However, these songs cover all skill levels—

a few even include rousing solos—so those who master this program can consider themselves competent at playing the six-string.

eMedia Guitar Songs costs \$29.95 and is available directly from the eMedia Web site at <http://www.emedia.org/or der.html>.

eMedia Corp.

eMedia Guitar Songs,
Vol. 1
(888) 363-3424
(206) 329-5657
<http://www.emedia.org>



PowerTools Add To Financial Success

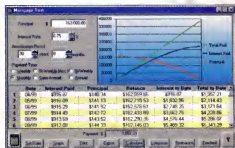
Financial PowerTools from Vorton Technologies Inc. features more than 30 calculators to help individuals and small businesses make wise financial decisions. The calculators allow users to figure out the annualized return and after-tax yield on an investment, as well as estimate mortgage payments, project future salaries, and perform numerous other calculations. The program also provides a currency converter; college and retirement planners; area, length, volume, temperature, and weight converters; and a money counter. Its Help menu includes definitions for financial terms and

concepts and, as a bonus feature, Financial PowerTools also offers a component for estimating payments on a car lease.

We were impressed with Financial PowerTools' intuitive interface. Individuals who have only minimal familiarity with financial terms will be able to use the calculators without referring to the users manual or Help menu. Users simply enter numbers into the clearly labeled fields and press ENTER to perform the calculations. Users can refine the calculations by taking advantage of the various advanced functions, as well. For example,

one advanced function determines the effect of a lump payment at any point during a loan repayment period.

After the program completes the calculations, the results display on two-dimensional (2-D) or three-dimensional (3-D) graphs. Many of the investment and loan calculators also provide spreadsheets detailing year-by-year or month-by-month growth and repayment options. Users can save and print all of the graphs and spreadsheets for future reference. The Web offers an assortment of similar calculators free, but these



Financial PowerTools' Mortgage Calculator calculates your monthly payment and provides a graph and spreadsheet of the repayment plan.

online calculators do not provide graphs of the results, nor do they allow users to save the results for future reference. For less than \$40, Financial PowerTools is a valuable asset for any investor's portfolio of software tools.

Vorton Technologies Inc.

Financial PowerTools
(613) 721-1107
<http://www.vorton.com>



Share Nshare Alike

connection.

The install requirements are simple. The PCs must be conjoined on a local-area network (LAN) or via a serial cable, and one PC on the net-

works as many as 25 users on a cable modem or DSL connection, and it supports as many as six users on an analog modem connection.

Next, users need to install Nshare on all the PCs that will share the connection. The installation itself is a seven-click process, during which users designate each PC as either the base computer (the PC that maintains the Internet connection) or as a client. Then, after the installation is complete, users simply reboot the connected PCs.

Initially we were confused because Nshare runs so quietly in the background that

we didn't realize that Nshare was completing its work. (The program didn't include an installation guide.)

We accessed the Web, sent and received E-mail, and read newsgroup messages from all the networked PCs. Plus, we were able to do all of this without suffering any noticeable lags in speed.

Prices start at \$39.95 and vary according to the number of PCs that will share the Internet connection. A trial version of Nshare is available at <http://www.miralink.com/nshare.htm>.

Miralink Corp.

Nshare
(801) 575-5465
<http://www.miralink.com>

Imagine a program so deceptively simple to use that it confuses people. That's what we encountered when we tested Nshare, an Internet connection expander (ICE) application from Miralink Corp. that allows multiple PCs to share a single Internet

work must have access to the Internet. Nshare can use any type of Internet connection, including an analog modem, cable modem, Digital Subscriber Line (DSL), Integrated Services Digital Network (ISDN) line, or a leased line. And Nshare

Hardware

Two new ThinkPad 570 notebook computers from IBM offer users computing power in an ultra-portable, four-pound package. The \$3,470 model 26443AU comes with a Mobile Pentium II 366 megahertz (MHz) processor, 64 megabytes (MB) RAM, a 6.4 gigabyte (GB) hard drive, and a 13.3-inch display. The 26442AU sells for about \$2,700 and includes a Mobile Pentium II 300MHz chip, 64MB RAM, a 4GB hard drive, and a 12.1-inch display. The one-inch thick unit doesn't include a CD-ROM drive, so if you need one you might consider the optional UltraBase that lets you add a CD-ROM drive, DVD-ROM drive, Zip drive, or other hardware extras to the mix. (888/411-1932, 914/765-1900, <http://www.ibm.com>). ► Olympus America Inc.'s DS-1500 Digital Voice Recorder utilizes 8MB of



Microworkz offers low-cost WEBzter computers.

memory and a Variable Control Voice Actuator (which stops recording during silent moments) to offer users more than 2 ½ hours of digital recording time. The unit's liquid-crystal display lets users track remaining recording time, battery status, date, and time. Special editing features let users insert, delete, or partially erase sections of a recording. The device includes software that lets users download their recorded data to a PC and convert it to text (800/347-4027, 516/844-5000, <http://www.olympus.com/digital>). ► Basic home computers

keep getting cheaper. The new \$299 WEBzter Jr. Computer from Microworkz.com offers a Cyrix 300-MHz chip, 32MB RAM, a 3.2GB hard drive, and a K56 v.90 modem (add a CD-ROM drive and diskette drive for an extra \$99). The system comes with Microsoft Windows 98 (Win98), Corel Word Perfect Suite 8, and one year

of unlimited Internet access through Earthlink. Users looking for more power can spend \$499 for the WEBzter system with a 366 MHz processor, a 4.3GB hard drive, a diskette drive, and a 24x CD-ROM drive. WEBzter Sr. Offers a 400 MHz AMD 400 K6-2 processor, a 6.4GB hard drive, and 64MB RAM for \$699. The systems lack a monitor, but the company will sell you a 15-inch model for \$139. Shipping costs \$75 per unit, plus another \$20 if you order a monitor (888/538-5791, 425/744-7722, <http://www.webzterpc.com>).

Software

Using FreeSpeech 2000, consumers can dictate and voice edit text and numbers and perform voice-based commands on the Web and in Windows. The speech-recognition software product from Philips Speech Processing adapts to an individual's normal conversation speech style. It also converts the data into text in various applications, such as Corel WordPerfect, Office 2000, and Internet Explorer. Minimum system requirements include a 166MHz Pentium processor, 48MB RAM, and Windows 95 (Win95), Win98, or Windows NT 4.0 (WinNT). Due out in the last half of this year, the FreeSpeech product with a headset sells for \$109. Add a microphone, and it sells for \$169 (800/235-7373, <http://www.speech.philips.com>). ► File Rescue Version 2.0 from Software Shelf International Inc. promises to help you avoid the frustration of losing a document because you accidentally

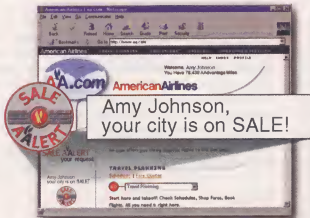
ditched it from your hard drive or other storage medium. As long as your computer has not overwritten your files with other data, File Rescue can retrieve them even if you've compressed or deleted them from your hard drive, diskettes, or external drives. The company says the \$75 program is not a replacement for the Windows Recycle Bin, and does not change or replace any information on the computer, but restores lost data to a selected location (800/962-2290, 650/369-5200, <http://www.sofwareshelf.com>). ► Manage all your scanned, electronic, and downloaded Web documents with PageKeeper Pro 3.0 for Win95, Win98, and WinNT. No matter what kind of files you have on your computer, Caere's PageKeeper presents you with thumbnail images of documents, maintains original file formats and locations, and automatically updates an index of all document words for ease in searching. In addition, a "clipping" feature enables you to attach



FreeSpeech 2000 lets users voice edit text.

several different file types and manage them as one document, while other options let you open a document file in a "non-native" application, keeping the original formatting intact. For example, you could open an Adobe Acrobat .pdf file in Microsoft Word, or you could open a Word document in your Netscape browser. PageKeeper sells for \$49, and owners of any Caere product, or another desktop document management software product, can purchase this program as an upgrade for \$39.95 (800/488-1133, 408/395-5733, <http://www.caere.com>).

How Will I Know When The Right One Comes Along?



Meet the AA.com™ new Sale AAlert feature. It's a match made in... The Caribbean. Or Paris. Or even your hometown. Just tell us where you want to go, and AA.com will notify you on your personalized home page whenever that destination's on sale. Sale AAlert will even give you the "lowdown" on specials out of your home airport. Love that low fare? AA.com's innovative booking tool lets you buy it right online instantly. The new Sale AAlert feature, only at AA.com. Built around you, there's no other site quite like it.

The ultimate web site for everything **AmericanAirlines**™

American Airlines and AA.com are marks of American Airlines, Inc.

Using Windows Update

If you've ever started a program only to discover it had a few quirks and needed a patch to run properly, you will appreciate the Windows Update feature in Windows 98. Because software companies are constantly tweaking products to fix bugs and improve the program, running the Windows Update on your system is a great way to keep it in top condition.

No two systems are the same because most users are always adding favorite programs and screen savers, which changes the original system settings. Thankfully, many software updates are at your disposal with the Windows Update direct link to Microsoft's Web site (<http://www.microsoft.com>). This site offers the latest software patches and device drivers for your hardware peripherals so the entire system can function better.

What You'll Find

Starting the Windows Update procedure is simple. First open the Start menu and select Windows Update from the Settings menu. Next, initialize your Internet connection, and the Microsoft Windows Update site automatically loads. There are two main areas on the page: a Product Updates link to download and install the latest updates and a Support Information section to navigate the Windows Update site. Click the Product Updates link, and a menu appears with Critical Updates, Picks Of The Month, Recommended Updates, Additional Window Features, and Device Drivers.

As the site loads, a message box will appear explaining that Windows Update can scan the components on your computer to see if it needs upgrades, components, and enhancements. Click Yes to proceed. After Windows scans your system, a

window appears listing possible software upgrades.

Here you will find Critical Updates, which are deemed the most important for keeping you system running at its peak. Included are the Windows 98 Year 2000 Update, which corrects minor issues associated with the Y2K problem, and Microsoft Virtual Machine, which features a faster way to run Java for quick animations and to handle advanced Web pages with numerous graphics.

Picks Of The Month consists of a few favorite programs such as Microsoft Internet Explorer 5 and Internet Tools. These picks aren't vital to the system, but they may give you a performance boost.

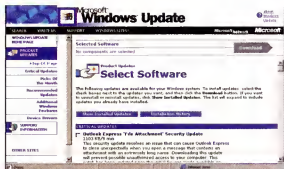
You can further refine your PC with a few programs from the Recommended Update category. Recommended Updates are programs designed to enhance the features that are already on your system. For example, if you have DirectX installed, you may want to download the DirectX 6.1 Technology Update, which improves three-dimensional and gaming programs.

In the Additional Windows Features section, you'll find a wide range of tools including the Windows Media Player 6.1, for watching movie clips or listening to music on your PC; and NetMeeting 2.11, for using your PC as a videophone for business meetings or sharing programs over the Web. There also are fun programs to spice up your Desktop such as the Science Fiction Desktop Theme, which features a spaceship pointer and screen saver.

To download one of these handy updates, click the box beside the

updates you want, then click Download. The Download Checklist will appear with a list of the updates you selected, a link to View Instructions for the software you're installing, and a Back button to return to the updates page. To proceed, select Start Download. Select where you want to save the updates, then click Save.

The last Windows Update section is Device Drivers. When you click this link, the Windows Update dialog ap-



Windows Update features important product updates that could be critical to your system's performance. You'll also find some recommended updates, device drivers, and additional Windows features to keep the system running smoothly.

pears to let you know the program will check your system to see if new device drivers are available. Click Yes to proceed. The Update Wizard scans your system to check which files you should install, then lists available updates. To update the system, click the update program to highlight it, select install, and then confirm the installation by clicking OK. Your system will then download the file. Once the file is downloaded, you will need to reboot the system for the new drivers to take effect.

If you want your system to maintain its tip-top shape, use Windows Update. This service is free to all registered Windows 98 users, and it's easy to use. We recommend using Windows Update about once a month after you download a new program or add a peripheral to your PC. ■

by Buffy Cranford-Petelle

Channel Surfing With WebTV

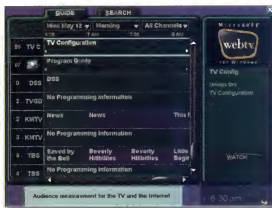
There has been a slow change occurring in the homes of many Americans. Gradually, almost imperceptibly, Americans are beginning to put down their remote controls and reach for their mice. It's not that we don't want to watch television, it's just that there are some really cool things online, and before you realize what time it is, the "X-Files" is almost over. A television tuner card and WebTV for Windows can put a television on your Desktop and help you stay more in tune with your favorite programs.

Equipment

While traditional WebTV is a set-top box that brings the Internet into your television, WebTV for Windows enhances television content you bring into your computer. If you have Windows 98, you already have the software you need to watch television on your computer. However, you'll probably need to buy extra hardware, namely a television tuner card such as the ATI All-In-Wonder Pro (<http://www.atitech.com>, \$149). If your system already has a graphics card that supports TV In and it is supported by WebTV for Windows (it doesn't support all television cards), you won't need new hardware.

Installation

Before installing WebTV, you need to make sure your television card is working properly. Then, place the Windows 98 CD-ROM in your CD-ROM drive and double-click Add/Remove Programs from the Control Panel (click Start, Settings, Control Panel). Next, select the Windows Setup tab and scroll down the list of components until you find WebTV for



You can easily find your favorite program in WebTV for Windows by sorting programs by genre, actor, or keyword.

Windows. Double-click it and click the WebTV For Windows check box. Finally, click OK, then OK again to start the installation process. (NOTE: You may need your Windows 98 CD-ROM.) Your computer will then restart a few times to finish the installation.

Once the installation is complete, you can start WebTV by clicking the Start menu, Programs, Accessories, Entertainment, and WebTV For Windows. You'll have to configure the software when you run it for the first time. This configuration process includes a quick channel scan to determine what channels you receive. If it cannot download broadcast information over the air (which is when you don't have to tie up a phone line), it will ask you for your ZIP code and connect you to the Internet to download your local program guide.

Cool Stuff

The program guide lets you plan your viewing schedule and even lets you to search the schedule by genre, actor, or title. A couple of extra channels provide for video inputs, such as a VCR or cable box, and a configuration channel gives you quick access to the

software settings. You can configure the computer to update the guide automatically at a given time every day. You will also see a preview box that displays the current channel in the upper-right corner. It allows you to jump to any channel by double-clicking it from the program guide.

Intel's InterCast technology also comes in the software. InterCast allows broadcasters to send Web-like information over the air to enhance programming. For instance, CNN can broadcast news content along with listings of other top headlines and even links to Web sites where you can get more information. InterCast scans the Vertical Blanking Interval (VBI) for

information and displays the information in the InterCast software. The VBI is an unused portion of the broadcast signal. (It's the black band above the picture when your television is scrolling vertically). Broadcasters often embed Closed Captioning in the VBI (Don't worry, though, there is plenty of room for additional InterCast data).

Problems

Unfortunately, these products do have some downfalls. Currently, InterCast is only available through cable systems, not over antennas or through satellite broadcasts. In addition, some cable systems use the VBI for their own needs, rendering it useless for InterCast purposes. Some television providers require the use of a receiver or cable box to receive premium or pay channels and some require a box to receive any signal at all (such as satellite providers). If you connect to your television card through a cable box or receiver, you'll have to change channels on the receiver, not through the software. This means you won't be able to jump to or preview channels on the program guide. ■

by Chad Denton

Tape Backups

If you plan to back up your Windows NT 4.0 system to tape, you'll need to know about the Control Panel's Tape Devices utility. We'll show you how to use it to get your tape drive running, and then how to back up and restore your files using Windows NT's Backup utility.

Driver Installation

If you've installed a new tape device but haven't installed its driver yet, select Start, Settings, Control Panel, Tape Devices, the Drivers tab, and then Add.

To use a generic driver supplied by Windows, select the drive's manufacturer from the menu and click OK. Then insert your Windows NT CD-ROM at the prompt. You may have to use the Browse button to help Windows find the file it needs. Click OK to continue.

Although a generic driver will usually work, it's better to use the manufacturer's driver. If you have the driver file on diskette or somewhere on your hard drive, click Have Disk and browse for it. Make your selection and click OK. Once Windows installs the driver, click Yes to allow the computer to restart itself. Then go back into Tape Devices, where you should see the new entry.

Backing Up Your Files

As an alternative to the backup software bundled with your tape drive, you can use Windows NT's Backup utility to copy some or all of your files.

Backup can span backups over several tapes in case your files won't fit on one tape. (NOTE: *Because Windows NT's security measures include different levels of file access, backups and restorations need to be performed by someone with read/write access to all files.*)

To run Backup, insert a blank tape into your tape drive. Click Start, Programs, Administrative Tools, and Backup (or click Start, Run, type ntbackup at the command line, and press ENTER). In the Operations menu under Hardware Setup, select your tape drive if it is not already selected and click OK. Click the Tapes window so it is active, and then double-click the hard drive's icon. Select the files and folders you want to back up by clicking the checkboxes next to their entries. For example, to back up the entire C: drive, simply

click the box next to C:; it isn't necessary to click each file. To uncheck an item, click its box again.

Now click Backup. Its dialog box offers several options:

- You can append the backup data after the information is on the tape or replace the old with the new.
- Verify adds an extra read step after the backup to ensure accuracy.
- Backup Local Registry will make a copy of your individual workstation's Registry.
- Restrict Access To Owner Or Administrator is a security measure.
- Hardware Compression will compact your backed-up files (if your tape drive supports this).

- Backup Set refers to two or more tapes required for a large backup. You can describe the set here.
- Choose Normal Backup Type to copy every file you select; choose Incremental to back up only the files that have changed since the last backup.
- Backup keeps a log file of events that happen during a backup. You can read this by clicking Start, Programs, Administrative Tools, and Event Viewer. You can set it to keep Full Details (all file names and events), Summary Only (events such as starting, ending, and failures), or even Don't Log.
- Finally, click OK to start the backup. You can watch the status window to track its progress.

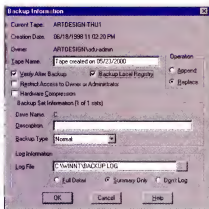
To restore a tape backup (that is, replace the files on your hard drive with the files you backed up to tape), open the Tapes window and double-click the backup set on the left half of the window. Select the files you want, then click Restore and OK.

Other Backup Products

Third-party backup applications for networked systems vary widely. For individual workstations, UltraBac's UltraBac Personal Edition (\$149) offers speedier and more secure backups, support for software compression, and the ability to back up open and shared files. Its scheduler even allows your own command lines to run before and after a backup. Best of all, UltraBac's Web site (<http://www.ultrabac.com>) offers free downloads of certain backup and disaster recovery utilities.

NovaStor's NovaBACKUP NT Server (\$99; download at <http://www.novastor.com>) provides compressed backups of your server and workstation that can be completely automatic. Add in updatable virus protection, NovaBOOT disaster recovery, and free technical support, and you have quite a list of features for the price. ■

by Marty Sems



Choose your backup and security options in the Backup Information dialog box.



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Delete & Undelete Files



We've all warned each other about saving regularly. After years of saving everything in sight, you probably have a lot of files stored on your PC's hard drive. Like the human stomach, it will eventually fill up and be unable to swallow another byte, signaling when it's time to switch tactics and start deleting files, with care, of course.

MS-DOS 6.22

DOS 6.22 uses the logical DEL command to delete a file. At the command prompt for the correct drive, type `del <filename.filetype>`. Once you press ENTER, the computer immediately deletes the file. If you have typed in the wrong file name, DOS will display the message "File Not Found." If it says nothing, consider your file history.

If you accidentally delete the wrong file, don't panic. DOS hasn't physically erased the file yet. DOS only changes the first letter of a deleted file's name and then no longer recognizes the file as actively available. It will eventually overwrite the file's contents when it needs the space, thus permanently removing it from your hard drive. In the meantime you can still retrieve it with an UNDELETE command. Your chances of regaining the file depend on how quickly you use the UNDELETE command.

Access the directory from which you deleted the file. If you have deleted the directory (or folder), you cannot retrieve the file. Type `undelete/all` to command DOS to recover all possible files without a confirmation prompt from you. This returns files to your directory with a different first character, often # or %. You also can type `undelete`, after which DOS will ask you whether you want to restore each undeletable file. After you type Y for "yes," DOS asks you to rename the first character of the file. Type a letter, and your file is saved.

Windows 3.1

Of all the many improvements Microsoft offered in Windows 3.1 (Win3.1), deleting files was not one of them.

The company made this a fairly time-consuming process. To delete a file, double-click the Main icon in the Program Manager window. Double-click the File Manager icon within the Main window. Click the C: drive button within the File Manager window and highlight the correct folder of the file from the list on the left with a single click, which will produce a list of that folder's files, which appear on the right. Click the one you want to erase. Open the File menu and click Delete (or once the file is highlighted, press the DEL key on the keyboard). Click OK in the dialog box that confirms the deletion. Click Yes in the next dialog box that confirms it again.

Undeleting Win3.1 files takes just as much work. In the Program Manager, double-click the Applications icon and then double-click the icon titled MWUNDEL inside the Applications window to open the Microsoft Undelete application. Open the deleted file's directory by clicking the Drive/Dir button above the file listings. A Change Drive and Directory box appears. Click the correct directory/drive and click OK. You may have to repeat this step if you seek a file in the WINDOWS directory. Change to the C: drive first, and then change to the WINDOWS directory. A list of files will appear, probably with ? as their first letter. Highlight the file(s) you want and click the Undelete button above the list. An Enter First Character dialog box will pop up asking you to choose a first letter for the file. Type a letter and click OK.

Windows 95/98

To delete a file from Windows 95/98 (Win9x), first access the file's directory. Double-click the My Computer icon in the upper-left corner of the screen and double-click the C: drive icon. If the file is within a folder, double-click the folder so you can access the individual file. You should see the file's icon. Click the file to highlight it and press the DEL key.

A Confirm File Delete dialog box will appear and let you confirm whether you really wish to delete the file(s). Click Yes. If the file has its own icon on the Desktop, drag it into the Recycle Bin icon.

Now that you have removed the file from its directory, it resides in the Recycle Bin, waiting for you to erase or restore it. To erase it, double-click the Recycle Bin icon. Open the File menu and click Empty Recycle Bin. Click Yes in the Confirm File Delete dialog box. This will prompt the PC to erase the file.

To retrieve a trashed file before you have emptied the Recycle Bin, double-click the Recycle Bin icon. Click on the file's icon within the Recycle Bin and drag it out of the box and onto the Desktop or into a folder. Double-click the file's icon once it is on the Desktop, and the file will open. Open the File menu and choose Save to resave the file.

Access Files



In an ideal world, we'd all find everything as quickly as librarians can track down books and periodicals. These reference experts know their turf so well that they head directly to the correct room, aisle, and shelf. A computer requires the same of its users. If you know your way around your system, you'll be able to find your files quite easily.

The following primer will help you learn to access your files though the numerous paths available in every operating system. The computer itself will almost walk you through most of them.

MS-DOS 6.22

Just as a librarian must search the right book room, computer users must look on the right drive to access a file. If you want to access a document saved on the computer's hard drive and not a diskette, you'll need to look on the C: drive. Type CD C:\ to access the root directory of the C: drive. CD stands for change directories. Type the following commands to open the file from here:

dir (to show a listing of files)

edit <filename.filetype> (if the filetype is specified in the directory)

For example, let's say we want to open a file we had previously saved as Smartcom.txt. Typing **edit smartcom.txt** opens the .TXT file in our text editor. If you fail to type in the file name correctly and type **smartco.txt**, for example, you'll open a new file with the incorrectly spelled name instead of the one you had originally saved.

If you know the program the file was saved from, but not the name of the file itself, you can try to access the file through the program. Type the program name at the command line to open it. For example, typing **edit** accesses MS-DOS Editor. You'll need to press ESC to close the Welcome To The MS-DOS Editor dialog box. Then press ALT-F-O to open the File Menu and open a file. Now you'll see a box with a list of files on the left. Use the TAB key to highlight Dirs/Drives or press ALT-D. Press the Down arrow key until the cursor blinks on the first letter of

DOS (or another directory or drive) and press ENTER. The list of files in that directory will appear in the list at the left. Now press TAB-SHIFT to access Files. Highlight the correct file using the arrow keys and press ENTER to open the file.

Windows 3.1

Win3.1 offers easier access to files than DOS 6.22. First open the correct program using the Program Manager. Double-click on an icon at the base of the window to open another window with numerous program icons such as Applications or Accessories. Scroll through the list of icons by dragging the scroll bar downward (at the right of the window) until you find the correct program. You may have to open more than one window to find the program you want. Double-click the program, click the File menu, click Open, and double-click the correct file under File Name. Make sure you double-click the correct directory under the Directories list. Click OK.

If you do not know the program with which the file was created, you can access the file through the File Manager. Double-click the Main icon in the Program Manager and double-click File Manager. Click the correct drive shown under the title bar. The drive options may be A: (diskette), C: (hard drive), and D: (CD-ROM drive). The C: drive contains information stored on the computer's hard drive, so click the correct folder in the left box beneath the drives. Scroll down the list of files in the right box by dragging the mouse down the scroll bar to the right of the box. Double-click the file you need to open.

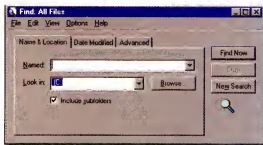
Windows 95/98

You'll have no trouble accessing files in Win9x; the biggest problem will be choosing which route to take.

You can quickly open recently used files through the Documents tab in the Start Menu. Click the Start Menu, click Documents, and select the document you want to open with a single-click.

Win9x offers at least four other ways to access files. If you have already opened the correct program, open the File menu, choose Open, and double-click the file you wish to open. (In Win95, you may have to change directories by clicking the down arrow to the right of the Look In box options to select a new directory.) If the document ap-

pears as an icon on the Desktop, simply double-click the icon. You also can double-click the My Computer icon, double-click the C: drive, and double-click the correct file or folder of the file.



Use the Find Files or Folders application to open a file if you cannot remember where you saved it.

Finally, try the Find Files feature by clicking the Start menu, Find, and then Files Or Folders. Type the name of the file you want to find in the Named: box. Click Find

Now. A list of files should appear at the base of the Find Files window. Double-click the file you need.

Printing



You're all geared up to print. You plugged in the printer, survived changing the printer cartridge, installed the printer with your operating system (OS), and even remembered the computer paper. To actually get your on-screen content onto paper, the computer must send a copy of the document to the parallel printer port, often referred to as

the LPT1 port. The LPT1 port sends the document to the printer, which converts the document into images on paper. The older the OS, the more the user has to direct the computer about what to do next. Newer systems are programmed to sort out most of the work themselves. If you've already installed your printer, you should have no trouble learning how to use it.

MS-DOS 6.22

MS-DOS 6.22 offers a few ways to print. You can press PRINT SCREEN, copy the file to the printer port through a DOS command, or print directly from the document. To print with a DOS command, first access the drive holding the file. Type the following:

```
C: (or letter of the diskette or CD-ROM drive)
dir (to see a list of files)
copy <filename filetype> lpt1 (only if the filetype, such
as TXT, is shown in the directory)
```

This directs the computer to copy the file to the LPT1 port. If the printer is installed and turned on, it will start printing. For example, the following command line will print the file called Readme.txt.

```
copy readme.txt lpt1
```

DOS 6.22 applications also let users print an open document through the File menu in the upper-left corner of the screen. Press ALT to jump to the menu bar and highlight the first letters of the menu titles. Press F to open the File

Menu and P to print. Use the Up and Down arrow keys to specify printing the Selected Text Only or the Complete Document. Now press ENTER to begin printing the document.

Windows 3.1

Win3.1 is basically a DOS operating system with a windows interface built around it. Therefore, printing in Win 3.1 resembles printing in MS-DOS 6.22. The file still copies to the printer port, but you don't have to direct it.

Open the file you want to print, use the mouse to open the File menu and choose Print. You also can use the Win3.1 keyboard shortcut for printing: press ALT-F and then P. The printer will either begin printing or wait for you to exit the Print dialog box that some programs use.

If you see the Print dialog box, click the circle in Print Range corresponding to All, Selection, or Pages, depending on what you wish to print. If you select Pages, the cursor will highlight the From box. Type the page number you wish to start on, use TAB to highlight the To box, and type the page number you wish to end on. Select the print quality, or dots per inch (dpi) of the printout, by clicking on the down arrow key to the right of the Print Quality: box. The higher the dpi selected, the better the print quality. Select the number of copies you want to print by double-clicking in the Copies box and typing the correct number. Clicking OK in the upper-right corner of the Print dialog box prompts the computer to copy the document to the LPT1 port and begin printing.

If you find DOS commands easier and want to print a document from a DOS program such as MS-DOS Editor, you can exit Windows completely and revert to a DOS prompt. Access the drive in which you saved the document, such as the C: drive, by typing C: and then copy <filename filetype> lpt1, just as if you had a DOS operating system.

Windows 95/98

Win9x users can use the same commands to print files. Open the file you wish to print, click the File menu, and select Print. The document should begin printing. You also can press ALT-F and then P as a shortcut.

If the Print dialog box appears, make sure the information is correct and then click Properties to see more printer specifications such as paper size, color, resolution, and font. Exit the Document Properties dialog box by clicking the X

in the upper-right corner and you'll find yourself back in the Print dialog box. Make sure the correct printer appears in the Name box. Specify the print range by selecting All, Selection, or Pages. If you choose Pages, type the page numbers you wish to start and end on. Choose the correct

number of copies you want to print with the up and down arrows on the right of the Number of Copies option. Click OK at the bottom of the window or press ENTER to begin printing the document.

Apply Unusual Keyboard Keys



For the most part, computer users stick to the familiar when it comes to alphabet and number keys on their keyboards. Thanks to E-mail and the Internet, we have added the @ symbol to our repertoires, as well. Throw in an ENTER and a TAB here and there, perhaps a BACKSPACE to correct spelling errors, and you'll cover the extent of most people's necessary keyboard keys.

Beyond the mainstream keys, however, are some esoteric options such as PRINT SCR, PAUSE/BREAK, and a couple of keys with icons rather than printed names. It seems like getting rid of these unusual keys would shrink bulky keyboards without hurting usability. But you might be surprised to learn how useful some of these little-known keys can be.

MS-DOS 6.22

You can't take advantage of all those exotic keys if you're using the DOS operating system (OS), which won't register some of the extra keyboard functions used on a Windows 98 (Win98) system. The WIN and APP keys (marked with the Windows logo and an icon of an arrow pointing to a menu, respectively) serve no purpose on a MS-DOS machine, but the rest of the unusual keys can be very useful.

PRINT SCR: Use this as a shortcut to print the current screen content.

SCROLL LOCK: This key stops commands from scrolling on the screen. Combined with the Pause/Break key, it will often halt an operation. The Scroll Lock light will turn on when the Scroll Lock function is applied. Pressing the key again turns off the function.

PAUSE/BREAK: Press this key to stop a scrolling screen, so you can read the information before it scrolls by. Many games also program this key to pause a game in progress.

Windows 3.1

Although Windows 3.1 (Win3.1) is more advanced than DOS, the APP and WIN keys still do not work since they were introduced with Windows 95 (Win95). SCROLL LOCK, PAUSE/BREAK, and NUM LOCK perform the same tasks they do in DOS. Only PRINT SCR has an updated use.

PRINT SCR: This transports an entire screen into an image editing program such as the Paintbrush application. Press PRINT SCR to copy the screen image. Open Paintbrush by opening the Start menu and choosing Programs, then Accessories, then double-clicking the Paintbrush icon. Press ALT to access the pull-down menus, press E for the Edit Menu, and P for Paste. The screen you saw as you pressed PRINT SCR will appear inside the Paintbrush screen as a new image.

Windows 95/98

You shouldn't run across any keyboard keys that do not function under Win9x, but you'll find that many keys have different uses under this operating system. SCROLL LOCK is the only key that does not change its use in Win9x.

APP key: This key produces a pop-up, context-sensitive menu akin to pressing the right mouse button. Press ESC to exit the menu.

WIN Key: When pressed by itself, this key opens the Start Menu. Combined with other keys, it opens a window of opportunities. WIN-TAB lets you highlight the separate applications in the Taskbar; pressing Enter opens the window of the highlighted application. WIN-E opens the Exploring My Computer window. WIN-F opens the Find dialog box. WIN-CTRL-F opens the Find: Computer dialog box if your computer is part of a network. WIN-M minimizes all open windows, while WIN-SHIFT-M maximizes all open windows. WIN-R opens the Run dialog box, and WIN-PAUSE/BREAK opens the System Properties dialog box.

PRINT SCR: This key will copy a screen into a graphics application, much the way it does in Win 3.1. Win95 and Win98 feature Paint (instead of Paintbrush) as the primary graphics application, but otherwise following the same directions lets you capture a screen image. ■

by Michelle Nelson

End The Paper Trail

Save Time & Space By Digitizing Your Documents & Photos

FROM SHOE BOXES TO FILING CABINETS, the amount of space each of us devotes to image and document storage defies measurement. Consider the number of vanished family photos, the missing extended warranty papers, the contract that was filed under *This* when it should have been *That*. When paper permeates our entire world, keeping track of each piece can be a Herculean task.

Fortunately, computers offer an increasingly inexpensive solution to the paper avalanche. While many people have given up pursuing the ideal of the "paperless office," more and more applications are emerging that allow users to not only archive their present images and documents in digital format but also eliminate going to paper in the first place.

Basic Mechanics

Nearly all of us have documents we want to protect from deterioration and keep at our fingertips for convenient reference. Copying such materials into digital format used to require high-end hardware and convoluted editing software. Today, a simple, fully functional scanning package costs less than \$100.

The only hardware you need is an average computer (any Pentium-class machine or equivalent will do) and a flatbed scanner. (Sheet-feed-only scanners are not capable of scanning objects such as book pages.) Nearly all scanners now come bundled with a simple software suite.

At its simplest (saving documents as uneditable images), the conversion process is a three-step affair. Just insert your document into the scanner, start the scanning (either through the editing software or a button on the scanner), and save the file to your hard drive. You can scan in an average page of text in less than 15 seconds.

For text purposes, there is little difference between a \$100 and a \$300 scanner. Many of the cheaper models are moving to the universal serial bus (USB) connector format. For most users, this should be fine although other USB devices on the PC may experience delays

while the scanner is active. More expensive scanners tend to be Small Computer System Interface (SCSI)-based. These operate faster and more reliably but require the added expense of an internal SCSI controller card.

Although you need good hardware, the heart of document

storage is software, an area too often ignored during the scanner purchase. To keep prices down, cheaper scanners use cheap software. Users who want to merely save documents without any retouching or modification don't need to worry too much about which graphics package is included. PhotoDeluxe or Photoshop LE, both from Adobe, will do the job quite nicely. However, quality differences become much more apparent when running optical character recognition (OCR) software.

When you scan a page, the computer recognizes it as one large picture. Letters are nothing but a collection of dots, the same dots that could be used to form a photograph. OCR software analyzes scanned pages by searching for dot patterns that match known text characters. These characters are then grouped into words and paragraphs. The end result is a text document, readable by any word processor. Good OCR is capable of performing this image-to-text conversion with better than 99% accuracy. Cheaper titles typically don't fare as well.



If your goal is simply to archive the original document, OCR conversion is unnecessary. However, once the document has been changed into text, you can cut and paste it into other documents, use it in E-mail messages, and alter and update it with a word processor.

OCR Up Close: ScanSoft

While there are many players in the OCR business, two companies offer the best reliability and value: Caere's OmniPage (<http://www.caere.com>) and ScanSoft's TextBridge (<http://www.scansoft.com>).

The "lite" versions of OCR software that are typically bundled with scanners aim only to excavate text from the original document. Nearly all formatting, such as tables or font styling, is lost, and all graphics are ignored. In addition, the OCR engine itself tends to be flimsier and less accurate. These omissions translate into hours of additional work for the user.

TextBridge Pro 9.0 is a complete OCR package. It preserves all document formatting and even automatically converts tables into Microsoft Word or Corel WordPerfect cell formats. It also saves color graphics, including their sizes and page positions. To help improve recognition accuracy, TextBridge both sharpens characters and removes the background tinting, which often confuses OCR routines. In addition, the program can recognize text in 56 languages. Lastly, Webmasters will appreciate TextBridge 9.0's automatic conversion of documents into Hypertext Markup Language (HTML).

Users who scan hundreds or thousands of pages will soon find themselves confronted with finding a needle in a document haystack. Organizing documents by file name and/or date will only work so far. Any scaleable document system must have the capacity to extract documents based on full-text or keyword searches. Few low-end scanning systems offer such powerful functionality. Fortunately, Pagis

Pro 3.0 (\$99 street), which is the software suite surrounding TextBridge, is one of them.

Aside from full-text and keyword searching, Pagis is also able to remember the names of compact disc-recordables (CD-Rs), Iomega's Jaz disks, and other storage media, so it will prompt you to insert the required disk when retrieving from a multivolume query.

Pagis Pro is a good example of the features you should look for in your software when you begin your document storage process. Establishing effective archiving habits up front will save on countless hours of patch-up work down the road.

Get The Big Picture

If you're like most people, you have tons of family pictures buried deep in your closets. Your relatives would love to see some of those shots, but sharing them requires either keeping extra copies of the print around or finding that pesky negative. If you do find it,

you have to venture out to a photo finisher and wait while a new print is reproduced. Most of us lose these negatives anyway and are left stranded.

Stranded, that is, unless you have a scanner. Just as text documents can be turned into digital images, so can photographic prints; however, choosing the right scanner for this job can be tricky. Accurate color reproduction and resolution depth are the two key factors in achieving high-quality results. A \$100 scanner may give adequate results for casual use, but money will buy the discerning user more happiness.

Color reproduction is one of those attributes that requires either a hands-on evaluation or a comprehensive product review. Keep in mind that photograph-quality optical resolution should begin at 600 x 600 dots per inch (dpi). Be careful with this, however. Many scanners, particularly low-end ones, use a software process called interpolation to artificially simulate higher resolutions. Interpolation does not yield the same quality as unenhanced optical resolution and you

Digitizing Tips

The future of archiving is obviously digital, but you're trying to figure all this stuff out in the present. If you feel a bit overwhelmed, don't worry. We've gathered a few tips to help you get started.

1. Use the right format. For graphics in particular, confirm that your file format is as accepted and generic as possible. Today, this means JPEG for small or home-use files and TIFF for high-resolution, professional images.

2. Quality vs. quantity. If you're archiving digital

photos, beware of compression methods, which can substantially degrade image quality for the sake of saving space. If you choose to use JPEG format, make sure your software supports the option for a low compression rate.

3. Migrate your media every three years. The CD of today will need to eventually move to DVD, unless something even more advanced develops in the interim.

4. Multiple backups. Never trust your dearest documents and images to one location. The beauty of digitization is

it allows for effortless file duplication. Make disc copies of your vital info and leave them with trusted friends or in a safe-deposit box.

5. Drop your drawers. All those files filled with warranties, contracts, and other official documents can be scanned without fear of negating your legal rights. According to Andy Marken, "It's been seven years since the legal system came around and said optically stored info is a legal document." So scan away and free up some valuable floor space. **II**

shouldn't view it as an accurate statement about a scanner's capabilities.

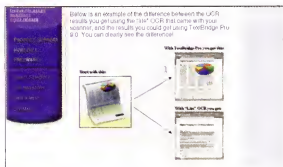
When your scanned image is imported into an application such as Adobe Photoshop, amazing things can happen with just a few clicks of the mouse. You can change eye color, darken washed-out skies, and even remove entire backgrounds. Naturally, the more expensive the software, the more features you get.

If you take digitizing photos a little more seriously, you can greatly improve image quality by investing in a film scanner and bypassing prints altogether. Some consumer-oriented models, such as Kodak's Advantix FD-300 (\$350), scan the Advanced Photo System (APS) format film directly into a digital file. Agfa's DuoScan T1200 (\$649) offers the additional advantage of being both a 600 x 1200 optical dpi flatbed scanner and film/slide scanner. At the high end is Polaroid's Sprint-Scan 4000 (\$2,000), which can scan slides and negatives at an optical resolution of 4000 dpi.

For the masses who don't have a film scanner, an increasing number of commercial services are available. Perhaps the most prominent of these is a joint effort by Intel and Kodak called Picture CD, which is now popping up at retail outlets across the country. With Picture CD, customers drop off their film for development as they've always done, only they check the Picture CD box on the drop-off envelope. When they return to pick up their negatives and prints, there will also be a CD containing JPEG scans of each photo. The suggested retail price of this service is \$8.95.

With software designed by Adobe Systems, Picture CD discs will automatically run on any Windows-based PC and display pictures in a thumbnail album format. Clicking a thumbnail brings up a full-sized version, which can then be subject to any of the software's special effects.

Seattle FilmWorks (<http://www.filmworks.com>) has taken the additional step of scanning every photo it processes for posting on the Web, at no extra charge. "It's a no-brainer for our customers," says president and CEO Gary Christophersen. "They don't have to make a decision or an economic transaction to get a set of



TextBridge Pro 9.0 is an optical character recognition package that keeps your scanned document's formatting and tables, rather than just the text.



With Club Photo's Living Album 99 software, you can take pictures directly from your scanner or digital camera and put them on the Internet.

images for the 'Net." Users simply give Seattle FilmWorks their E-mail address, and the company uses that to notify them when their pictures are ready. The images are then posted on a password-protected Web site.

Christophersen admits that getting customers outside of Seattle FilmWorks' established client base to convert to digital has been slow going. He does think, though, that once some of the higher-profile services such as Picture CD get popular, more people will be more willing to go digital with their pictures.

However, according to Andrew Wei, president and CEO of Club Photo Inc. (<http://www.clubphoto.com>), the traditional model of dropping off film for processing and printing crumbles in the face of filmless digital cameras and desktop scanning. In Wei's definition, true photo sharing is where digital photographs are passed around either through Web browsing or by E-mail, and any given viewer can elect to convert this digital file into a paper print.

Wei says operations similar to Seattle FilmWorks are flawed in that they put every picture they take up on the Web, rather than just the good ones you like.

Club Photo attempts to remedy this through its Living Album 99 software, available for free download at the company's Web site. Living Album 99 pulls images straight from any TWAIN (Technology Without An Interesting Name)-compliant scanner or digital camera. Users then plug their photos into any of several album templates, choosing only the ones they like and annotating them with optional text captions. The album is then uploaded to and maintained on Club Photo's server for free.

In the long-term consumer market, Club Photo's album sharing appears likely to be the model that prevails. Film may take decades to fade into widespread obscurity, but digital cameras are poised to replace film in the low-to-midlevel markets in just a few years. The companies that thrive will be the ones that devise new and exciting ways for digital photos to be manipulated and distributed.

Storage Options

Many people remember owning rows of 5.25-inch diskettes filled with files for old DOS-based or Commodore systems. If those diskettes have sat idle in a closet for the past 10 years, the odds of reviving their contents are slim. Not

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only have software file formats changed radically over the past several years but also the magnetic media itself is prone to deterioration.

Obsolescence has plagued long-term data storage since the days of punch cards. Today, the choice of which medium to use can be difficult, but often, the decision is ultimately made by circumstances.

For simple text storage, a common 1.44MB diskette is sufficient for temporary purposes. A full page of text averages about 7KB in size. Given this, a diskette should be able to hold roughly 200 pages of text. But despite the present ubiquity of the 1.44MB format, the diskette is on its way out. Superior technologies in the 100MB and higher ranges continue to drop in price and are gradually eroding the diskette's dominance. In addition, the magnetic media's relative fragility makes it a poor choice for long-term storage.

Despite an install base of more than 10 million units, Iomega's Zip drive, which uses 100MB Zip disks, is still too small, too new, and too fragile to offer a suitable long-term answer. A Zip disk is far more suited to handling large graphic images than a 1.44MB diskette, but Iomega is phasing out the 100MB in favor of a 250MB version. The same can be said of the company's 1GB Jaz format, which is now being superceded by a 2GB version.

Recordable CD media (CD-R and compact disc rewriteable [CD-RW]), which can store up to 650MB per disc, then becomes the default solution. Individual discs typically cost about \$1.50 to \$2 and can play in virtually all newer CD-ROM drives. Millions of computer users have a CD-ROM drive, so the CD format has an acceptance rate second only to that of the 1.44MB diskette. Furthermore, one CD can theoretically hold about 93,000 7KB text pages. Even a small gallery of high-resolution photographs, which can easily be 50MB each, will fit comfortably.

"CD isn't forever," says Andy Marken, spokesperson for Verbatim, one of the world's leading media

manufacturers. "But it will be with us for quite awhile. One reason is the economics of CD-R media, then the CD-RW drives. With drives under \$200, why not buy one? If I want to send you a 10 to 20MB image, I have no problem doing it on CD because it only costs me a couple of dollars."

Marken says in reality, a CD will usually accommodate about 50,000 pages of text, enough to stuff four 4-drawer filing cabinets. Recordable DVD (DVD-RAM) stands to raise this bar with a storage capacity of 2.6GB, but DVD-RAM drives probably won't be less than \$500 until well into 2000, and individual discs cost about \$20.

This may be a superior option for office use, but consumers have little reason to switch over at the moment.

Digitizing your information is full of advantages. You get to clear all that clutter from your office and closets and you gain easier access to your files. Who knows, maybe someday soon you'll pull a CD out of your wallet to show your relatives pictures of the kids.

(NOTE: For additional information about how organizations are digitizing their archives, see this article on our Web site, <http://www.smartcomputing.com>.) ■

by William VanWinkle

Big World, Little Package: The Complete National Geographic

Few examples better illustrate the power of digitizing than The Complete National Geographic (\$199 DVD, \$179 CD). The set encompasses 109 years of the prestigious periodical's life—every cover, article, and advertisement ever printed between 1888 and 1997. That's 190,000 pages, including 9,300 articles and 180,000 images. This massive collection is available as either 31 CD-ROMs or four DVDs.

To ensure maximum reproduction quality, National Geographic had to find five copies of each issue. In some cases, this entailed canvassing libraries, used book stores, and even garage sales. Once assembled, these 6,236 copies occupied more than 90 feet of shelf space. Weighing in at 2,200 pounds, the

shipment filled five pallets before being sent off for scanning.

Providing easy access to this mountain of data requires a simple search interface. The Complete



National Geographic can be searched by topic, date, issue, and even author. Users also can peruse the Cover Gallery, which displays a year's worth of thumbnail issue covers per screen. Clicking any cover will open that particular issue.

The Complete National Geographic's one drawback is that every page remains a graphical image, meaning there is no text that can be cut and pasted. Users can zoom in on a page to read its contents, but there is no way to share articles with other applications.

As a cutting-edge example of consumer-level digital archiving, the software hints at one possible future for the publishing industry. As news and printed media continue their slow, inexorable march to digital formats, it may be that a Web-based format will become the norm. If readers want a permanent copy of their own, they need only browse the periodical's online archive, tag the pieces they want, and receive it all in the mail on a disk a few days later. ■

Merging PCs & Phones

Communications Get A Boost As The Devices Share Functions

BOTH BUSINESS AND HOME users have embraced computers over the last 20 years, and users realized early on that they needed to share data with others. This led to the development of the MODulator/DEMODulator, or modem, a device that let computers talk to each other over a normal voice telephone line. This was initially achieved by physically coupling a device with the handset. This device known as an acoustic coupler was prone to errors and not all that fast. In recent years, modems have advanced to theoretical connection speeds on normal phone lines up to 56Kbps (kilobits per second). Substantially faster connections are available with Integrated Services Digital Network (ISDN), Digital Subscriber Line (DSL), satellite connections, cable modems, and a plethora of other choices.

The combination of phone and computer goes much farther than just connecting to the Internet to download Web pages and software. It is now possible to hold voice conversations with people all over the world using the Internet as the medium. Microsoft's recently released MP-900 phone hardware connects to your PC, turning your system into a complete message center. Should you want to do away with the computer altogether, the WebTouch phone from Alcatel can surf the Internet and check E-mail without using a computer.



Having a conversation with another computer user over the Internet is a method of communicating that is more reliable and easier to achieve than an Internet caller attempting to connect to a telephone. This is because the software for compressing and decompressing the voice data is available at both points of an Internet call and does not rely on a third-party Internet Telephony Service Provider (ITSP).

It should be noted that using the Internet is not the only way to combine PC and telephone technologies. You can add a complete messaging system with voice mail and individual mailboxes to your phone by simply installing software on your system, which works in conjunction with your modem, sound card, and microphone.

We've found that voice E-mail works well over the Internet. It gives you the power to send a complete message as a file for the other person to download and listen to at their leisure. You are not relying on the speed of your (or the other party's) connection

for anything more than the rate at which E-mail is downloaded. This means that you can record and even script your message in advance if you are unsure of what to say on the spur of the moment. You can even send a picture along with your voice.

Save On Phone Bills

You can connect to another computer or even another phone by using the Internet. This will save you the cost of long distance or international charges, however, the cost will vary depending on the option you choose. Instead of dialing someone directly on the regular telephone, you connect to an ITSP through your normal Internet connection. The ITSP acts as a gateway for your call and generally costs no more than a normal local connection. The ITSP then routes your call to another local connection at the other end of the call and charges you a lower rate for the connection. The connection cost can be as low as five cents a minute.

All that's required is a good Internet connection, microphone or headset, and an additional account with an ITSP, like Delta Three (see below), to make all your calls. However, if usage conditions are not ideal, your calls may feature a lot of line noise and interruptions. The system will become more useable as connections improve around the country and the world, but Internet telephony is not at the stage where it will replace your long distance carrier anytime soon.

The quality of Internet phones is still patchy at best, but as Internet access gets speedier and cable modems and other high speed connections become more prevalent, using the Web to vocally connect people may well become the de facto method of communications in the not-too-distant future. Unfortunately, the savings of up to 70% offered by Web telephony companies may well be lost, due to the amount of time required to place calls

during times of even moderate traffic. For example, it is possible to get regular phone rates as low as nine cents a minute state to state, cheaper than the 10 cent rate offered by Delta Three.

Internet Phone

<http://www.vocaltec.com>

This \$49.95 online product from VocalTec is an Internet phone with a chat client that uses the built-in Community Browser. You can add a phone service for PC-to-Phone communications. You can check out all the details of ITSPs at the Web site.

Internet phone offers full duplex PC-to-PC operation, which lets you talk and listen at the same time, as long as your sound card is capable of supporting the feature. Fortunately, most sound cards released since Creative Labs' Sound Blaster 16 will provide full duplex operation.

You can connect a video source to Internet Phone and send live pictures along with your voice for full conferencing capabilities. Of course, the quality will depend on other Internet traffic, but a green bar at the bottom of the onscreen window shows you how good the connection is. In circumstances surrounding poor connection, using the Text Chat and White Board features to emphasize your words are preferable to voice communications.

Delta Three Service Provider

<http://www.deltathree.com>

Delta Three is an Internet Telephony Service Provider—commonly referred to as an ITSP. The company will set up a pre-paid account that you will be able to use to make PC-to-Phone calls anywhere in the world. Costs are typically 10 cents a minute for PC-to-Phone usage and 15 cents a minute for Phone-to-Phone.

You can integrate a Delta Three account into your VocalTec Internet

Phone software or use the simple dialer software available for free download from the Delta Three's Web site. The dialer software logs onto the server when executed. Delta Three is also currently beta testing a new package that offers voice mail, fax, and E-mail services known as D3Box. This lets you check all services from a PC or a phone without incurring other costs or having to look in several different places for different messages. The beta program offers all of this at no cost. To sign up and try D3Box for yourself, visit <http://www.deltathree.com/d3box/index.asp>.



A unit that plugs into your PC and extra buttons on the handset hint that this Microsoft package is no ordinary cordless phone.

IDT Net2Phone

<http://www.net2phone.com>

Downloading and registering for the Net2Phone software is free. However, using the service requires you to add funds to your account. However, those of you calling toll-free numbers will be rescued from charges, since these are considered free calls by Net2Phone. Pricing varies, but as an example, international calls from the United States to the United Kingdom cost 10 cents a minute. Net2Phone has a

setup wizard that makes configuration simple, and you can use the system to call IDT customer service for help by dialing 90 in the program.

PowWow

<http://www.tribalvoice.com>

This is an interesting and free program that is designed primarily as voice chat software. It has a lot of features aimed at the home user, such as cartoon images for profile pictures and comical sounds that can be sent to better express yourself. All voice transmissions are converted into .WAV files. The .WAV files are sent as packets to other users in a conference. Groups of conference users are referred to as a community. The feature that makes this a viable PC-to-PC

conference program is the ability to buy a license to host your own community for \$49.95 per year. Buy hosting a community, you can invite clients, colleagues, friends, and family into your community. Then you will be able to communicate, using voice or text, and share programs, surf the Web, or share a white board.

VoxPhone

<http://www.voxphone.com>

You can connect directly to another person or arrange a conference with more people speaking simultaneously using VoxPhone 3.0. The software can be downloaded for free and will allow you to connect to other VoxPhone users. Users may also emulate the standard format used by Microsoft's NetMeeting and others. However, if you are not talking to another VoxPhone user, conferencing, file transfer, text chat, and Voice Font features will be unavailable. Voice Fonts are particularly enjoyable and allow you to change your voice to make it sound robotic or even like that of the opposite sex.

Voice Share

<http://www.voiceshare.com>

This service lets you add voice to your Web site or send a voice E-mail using the telephone instead of having to connect to an Internet Service Provider (ISP). By dialing the number provided, you can leave a message or E-mail address for the person you wish to contact. Alternatively, you can provide a Web address where you would like to see your message. Some of these messages may include special offers to an E-commerce site or having a message of the day from a wise old man, amongst others. The message is stored in RealAudio format and there is a RealAudio player available at no cost from the RealNetworks Web site at <http://www.real.com>.

Phone Access

New devices are constantly being designed and marketed that connect

the PC and the telephone. Two such products are Microsoft's MP-900 Phone and Alcatel's WebTouch Phone. Both of these products blur the edges around the telephone and the PC and help to redefine the roles of each. The WebTouch Phone lets you do things that traditionally require a PC connection and the MP-900 Phone requires a computer to take advantage of its features. Both products allow you to broaden the range of PC or phone usage.

Adding hardware such as the Microsoft phone provides many more features than the traditional telephone. This seems to indicate that the combination of PC and telephone technology has come a long way. The convergence of these two technologies is worth watching. The voice mail system feature of the MP-900 can help a small business appear to be much larger by simply allowing a boss to not answer common inbound phone calls. A voice mail system can also help a growing company organize its incoming data and is useful to families or other institutions where people call a single phone number and leave messages for different people.

Alcatel WebTouch Phone <http://www.alcatel.com>

The WebTouch combines a conventional phone with a color Liquid Crystal Display (LCD) screen and a retractable keyboard. This allows you to check E-mail, surf the Internet, make phone calls, and check voice mail from a single device. As you'd expect, the new gadget will also support Caller ID, Call Waiting, and Voice Messaging. Alcatel's HomeTop Solutions server technology allows touch screen access to many services on the new unit, which will be small enough to fit on a nightstand, kitchen counter, or anywhere else you might normally find a telephone. One button Internet access will provide features like instant phone number lookup on Web-based Yellow Pages services, weather

information, or even recipes. Pricing is expected to be approximately \$300.

Microsoft MP-900 Phone <http://www.microsoft.com>

When it comes to connecting devices to your PC and integrating two technologies, Microsoft provides a viable answer. Apart from being a good quality 900MHz cordless phone, this product offers a complete message center, and Caller ID functions add even more. You'll find voice-operated access to dialing and other functions, a built-in speaker for hands-free dialing and message retrieval, a multi-mailbox message center, dialing from Microsoft's Outlook Address Book, a Do Not Disturb function to screen calls, and much more.

Some of the afore-mentioned features can be found on a standard phone, while others can only be accomplished by computer link. For example, you may dial in to hear your voice mail and even have it read back to you. By setting Outlook Express to check your mail at preset intervals, you can be kept current no matter where you are. If you prefer to have your system call your cell phone or pager when new messages arrive, the system will happily comply. Having the phone attached to your computer also means that you can store all of your addresses and phone numbers where they are most useful and easily accessible—the phone itself. Using



Talk to yourself to test VoxPhone Pro's settings.



The handset graphic actually lifts when you make a call over the Internet with Net2Phone.

Caller ID and the built-in voice recognition software, you will no longer have to dial your friends, family, or other regularly accessed numbers.

The software and hardware also allows you to use your computer as a phone. Adding a headset to your armory means you don't even need to take your hands off your keyboard or mouse to carry on a conversation. However, you can also use the microphone supplied with your computer or sound card. The MP-900 includes full setup software and is priced at \$159.99.

Moving Along

Connecting the phone and PC is a great idea. Using the software and processing power of a

home computer adds many useful features to the traditional phone system design that has been relatively unchanged over the years. Voice mail systems have been common in the business world for some time. Many of these systems are based on a PC, so it's only natural that the power be extended to home users as well. However, until faster and clearer connections become available at lower prices, we recommend seeking out a good telephone service for those long distance and international calls until telephony matures. ■

by Tony Kaye

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AOL.com represents America Online's stab at a comprehensive portal Web site available to all.

America Online, a company best known for its proprietary online service, also runs one of the most visited Web pages in all of cyberspace. Although AOL.com exists mainly to serve as the default first page America Online users see when they access the World Wide Web, you don't need an AOL account to visit AOL.com.

The eclectic collection of links comprises a full-featured portal site designed to entice users of all stripes. Along with the obligatory search engine and categorical listing of specialized sites, AOL.com (<http://www.aol.com>) offers some useful (and free)

communications tools, online shopping, and the ease of use we expect from a company famed for introducing people to the Internet.

AOL NetFind

As with any portal site worth its code, the heart of AOL.com is a search engine. The fastest way to use NetFind is to enter search terms on the main AOL.com Web page. There's really no need to click the Web Search link because it merely leads to a different arrangement of the same tools.

For simple searches, type in a few words that describe the object of your query. NetFind will search not only for the exact words you enter but also equivalent concepts phrased differently. For example, AOL says a search for "elderly people" also would find pages that mention "senior citizens" or "retired people."

As with any search engine, more descriptive search terms lead to better results. One key technique is to put

TIPS

... For Using AOL.com

Find Your Way. AOL's NetFind page includes a tiny Maps & Directions link that lets you find places in the real world. Along with driving directions and street maps of U.S. addresses, the map page includes a tab to access various international maps.

Visit The World. AOL.com is not the only AOL.com out there. In its bid for world supremacy, AOL has fashioned a number of regional alterna-

tives for foreign lands. You can find links to all of these exotic AOLs near the very bottom of the AOL.com page. Click one to brush up on your French or just to explore how other AOL users might see the world.

Converse. You can use AOL.com's Instant Messenger software to start your own private chat room with other Instant Messenger-wielding buddies.

On the main Instant Messenger screen, click the button that looks like three people and a dialog balloon. A Buddy Chat box appears where you can enter multiple screen names. Friends will have a chance to accept or decline your invitation. Everyone who accepts will immediately be transported to the private chat area.

Order Out. Some of AOL's most useful content is under

the Time Savers category. You can find most of these links in the Shortcuts column. Time Savers bring together a variety of third-party links centered on a useful theme. For instance, Plan A Night In includes several links for picking a movie to rent, ordering takeout food, or finding a good book. If you can't decide, there's always an exciting evening of Web surfing. **II**

phrases in quotes. Rather than searching for words by themselves anywhere on a page, NetFind will look for the exact phrase. Even so, popular topics return many pages. Fortunately, NetFind offers a few advanced tools to cut the clutter.

The most helpful are the Boolean operators AND and OR coupled with parentheses. For example, to find out what to feed a new puppy, you might try the search string "(diet OR food) AND (dog OR puppy)." NetFind will ignore those sites that only mention puppies or food, yet pages that use the words "dog" or "diet" rather than puppy food won't be left behind. NetFind also allows the use of plus and minus signs preceding words to specify terms that must or must not appear on a page.

To search the Internet for information other than Web addresses, click another choice in the AOL NetFind column on the main AOL.com page. The different search tools include now-familiar Internet standbys such as an electronic phone book, an E-mail address finder (which doesn't always work well), and a newsgroup search tool.

One of the more interesting search tools is called Kids Only. This basic search engine is advertised as linking only to sites that are safe for children. We typed in a number of search terms that frequently return questionable hits from normal search sites. The Kids Only search engine performed well, giving us links to a variety of family-safe content.

My News

Like most other portals, AOL.com also provides up-to-the-minute news. Click the My News link in the navigation bar at the top of the screen to check out the offerings. You can make My News a little more personal although we found the customization features were rather limited compared to Web competitors.

To start, click one of the personalize buttons and a registration screen appears. Enter your AOL username and password or make up a new one and follow the instructions. Here, you can set up a local weather report and customize stock information to report on your portfolio.

Web Centers

Like the Channels screen in AOL itself, the Web Centers area offers broad categories with specialized information inside. Many of these pages act as gateways to third-party sites. For instance, the Computing Web Center mainly contains news from C|Net, and many of the links on this page lead to actual C|Net pages.

Unlike a site such as Yahoo!, AOL's goal in Web Centers does not appear to be a comprehensive set of listings. Instead, AOL offers just a smattering

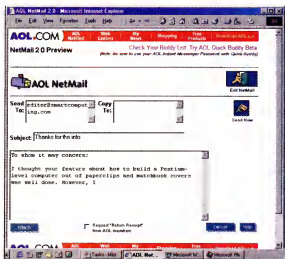
of information that is relatively straightforward: Clicking any of the categories in the home page's Shopping column pulls up a list of stores featuring products in that category. Click a store name and your browser is pointed away from AOL toward the selected shopping site. From that point on, AOL has nothing to do with your browsing and buying.

On the other hand, you can look at certain wares through AOL.com itself. At the top of every shopping category page is an advertisement for a product listed in AOL's Deals & Steals. Clicking the ad leads to more information about the product, along with a link to see even more Deals & Steals. The Deals & Steals screen displays a list of products with a drop-down category menu at the top of the page. Select a category in the menu and a new list of products appears. AOL doesn't sell these products itself but merely provides a gateway for different merchants to tell you all about their deals. Click an item to read more about it and how you can buy it with your credit card.

Community

Like many popular Web sites, AOL hopes to encourage "communities" to develop around its Web pages. Return visitors mean valuable eyeballs that AOL can count on when it makes pitches to advertisers. With that in mind, the Community section of AOL.com features a few ways to help user A connect with user B. The first and most heavily hyped is AOL's Instant Messenger, a buddy-chat program that lets users communicate via keyboards and exchange files in real time. In addition, Instant Messenger lets you know when other Instant Messenger-using friends are online.

Making Instant Messenger part of your social life requires downloading some easy-to-use software. Click the Instant Messenger link on the main



AOL users will appreciate being able to send and receive their America Online E-mail from any Internet-accessible computer.

of the best sites in each area. After that, it's up to you to seek out the information you need.

Shopping

For those times when you have too much cash lying around, AOL.com has a couple of shopping options. The

As a player in the portal wars and one of the most seen sites on the Web, AOL.com is full of content and intrinsic advantages. Back in the old days, <http://www.aol.com> was little more than a place to download America Online's proprietary software. With the growth of interest in the Internet and the burgeoning Web-browsing abilities of AOL, the site turned into a comprehensive information clearinghouse.

Today, AOL.com is the site AOL users see by default whenever they open their windows to the Web. You can configure

your AOL browser to open other sites instead, but inertia carries most users to the same old AOL.com. That means AOL continues to enjoy a virtually guaranteed audience every day. Even AOL users who don't spend much time on AOL.com itself probably can't help but take a quick glance at the advertisement at the top of the page. For AOL, this means more eyeballs to bring in revenue in an increasingly competitive market.

While AOL.com's NetFind is a useful search engine, the site as a whole is far from unique for the non-AOL user. As a portal

page, AOL.com barely breaks into the "average" category when compared to more full-featured, customizable sites. AOL.com may be resting on its tremendous user base, but things move fast on the Web. As other sites become ever more sophisticated, AOL users also will demand more interaction and better design.

For now, AOL.com is a serviceable portal page with some interesting community features. AOL users may want to experiment with other pages, but those inclined to leave well enough alone can find most of their needs filled by AOL.com. **II**

page and follow the instructions. Start up Instant Messenger and use either your AOL screen name or register as a new user. The New User Wizard (which is accessible from Instant Messenger's File menu) is a good way to learn the basics and begin building your own buddy list.

Besides typing with friends and family, Instant Messenger also lets you participate in the large array of chat rooms AOL runs. Once you have Instant Messenger installed, click the Join A Chat link in AOL.com's Community column. A new page appears with a list of chat subjects. Clicking a subject opens Instant Messenger and connects you to the chat automatically.

Talking and traveling. When you're on the road or away from your own computer, you can still participate in AOL chats or catch up with friends who use Instant Messenger. Best of all, you don't even need to download a new copy of Instant Messenger to do it. Just click the AOL Quick Buddy link under the Community section.

AOL Quick Buddy is a Java applet that works almost exactly like the standalone Instant Messenger. You can start a Quick Buddy session from any Java-capable browser, which means almost any computer with an Internet connection will suffice. After clicking the Quick Buddy links, a new window appears on your screen. It may take a few seconds for the Java code to download, but before long a box appears asking for your screen name and password.

Once you are signed on, Quick Buddy works nearly the same as Instant Messenger. The buttons look a bit different, but they perform similar functions. Click the IM button to enter someone's screen name and send a message. When you're finished, click the Signoff button to let other buddies know you aren't around.

Aside from the text chat abilities of Instant Messenger and Quick Buddy, AOL.com's Community features a few other means of keeping in touch. One of the most useful for America Online users is AOL NetMail, which lets you

check your AOL E-mail account from any Web browser.

Like Quick Buddy, NetMail doesn't require the computer you are borrowing to have any special software installed other than a Web browser. Click the AOL NetMail link under Community, then click the NetMail graphic. A new page appears with a screen that looks suspiciously like the Mail Center inside America Online itself. Enter your AOL screen name and password to get started.

If you've used your AOL mail much, the commands here will seem pretty familiar. You can check new mail, old mail, or mail you've sent by clicking the tabs; another button lets you write new mail. The best aspect of this system for travelers is that the changes you make to the inbox on NetMail will be reflected back home; you really are accessing your very own inbox from anywhere.

Other Offerings

Community Directory leads to another branch of AOL.com's cyberspace sprawl. The first link on this page points to the chat rooms we've already seen. AOL Hometown spices up the mix with links to AOL member home pages dedicated to different topics. AOL.com Communities wraps together member home pages with chat rooms, classified ads, and other content based on specific categories. The Community Center link leads to a gateway for exploring message boards, home pages, and offsite pages about the subject.

After exploring areas such as AOL Hometown or the different communications tools, it is clear AOL.com is at its best when it leverages AOL's huge community of users. As a standard portal for the masses, AOL.com garners a half-hearted yawn. As a tool for keeping up with AOL friends and meeting new people, AOL.com is second only to America Online itself. **II**

by Alan Phelps

Affordable conference calling

has just dropped

in your

laptop.



Growing your business
is an **easy call.**



Click2DialSM

With AT&T Click2Dial, anyone can set up a conference call. (That is, anyone with a computer and a phone. And isn't that just about everyone?)

Now you don't need an operator or special equipment to set up a conference call yourself. All you need is AT&T Click2Dial, your computer and a telephone to hold a business meeting

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conference calling
software

or family reunion with up to six people. What's more, you're in total control. You can add, drop, mute and view anyone on the call. There's even an on-line phone directory. So how do you get this amazing, affordable, do-it-yourself conference call software? You can get it right now with your computer. Just go to www.click2dial.att.com/tryit to download and for more details. Don't worry, it's absolutely free to download and there's no subscription fee. When a deal like this drops in your lap, it's an easy call to make.

www.click2dial.att.com/tryit

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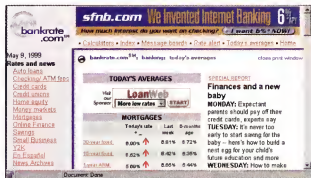
**Learn To Research Loan Rates
& Find Financial Information
Whenever You Need It**

If you're like most people, buying a car is a time-consuming process of negotiating the best deal. During your hunt, you'll probably visit several dealerships and several Web sites in order to compare prices. Once you select a car and a dealer, you might spend several hours (or days) negotiating a price you and the dealer can both accept.

Then, after you've spent untold hours sweating the details, you probably finish the deal like most people: You accept the first loan rate your dealer or bank presents to you. After all, finding a variety of information on vehicles is fairly easy, but finding information on rates and loans is a little more difficult. And most of the

information, because of the avalanche of numbers, can be more mysterious than helpful.

Considering the large amount of money you'll spend on an automobile, though, it pays to take some time to research loan rates. You can perform a lot of research in a short amount of time at bankrate.com (<http://www.bankrate.com>), an objective financial information Web site, also known as Bank Rate Monitor, for consumers. The site surveys banks and credit unions on dozens of financial topics, including all types of consumer loans. You'll also find financial advice and news at the site that will help take the mystery out of your financial matters.



Use the hyperlinks along the left side and at the top of the bankrate.com home page to easily navigate the Web site.

To move through the site easily, use the red text hyperlinks along the left side and top of the screen; these are available on every page of the site. The information you need appears in the middle of the Web page. On the bankrate.com home page, you'll see rates for several types of loans and savings accounts, plus links to the day's features and news stories, which usually provide consumer and small-business financial advice.

Top Links

The bankrate.com topics most popular with visitors are available through the red hyperlinks at the top of the page. (The Home link returns you to the bankrate.com home page.)

TIPS

... For Navigating bankrate.com

To see the bankrate.com site's information in Spanish, click the En Español link on the left side of any page in the bankrate.com site.

The Bank Rate Monitor is available on America Online through keyword BRM.

Use the links along the left side of the page to research a specific topic. For quick

movement between popular topics, use the text links near the top of the page.

If you're unsure about the meaning of some of the information you encounter while visiting the site, click the bankrate.com link along the left side of the screen. On the right side of the screen, click the FAQ's link, followed by Financial Questions link.

Each page at the site contains a banner advertisement in the upper-left corner of the page. When you click some links, you'll see a pop-up window containing advertising, too. Don't confuse this advertising information with the objective editorial information at the site.

When you enter some areas of the site, bankrate.com will

display the information in frames. If you decide to print some information, make sure you're printing the correct frame.

To use any of the site's financial calculators, you'll need a Java-enabled Web browser.

The Index link is the quickest way to find a particular topic at the site. ■

Calculators. You can calculate the impact of dozens of financial situations, including mortgages, savings, moving costs, credit card costs, and consumer loans, using the bankrate.com calculators. (NOTE: We encountered problems with some features of the Java-based calculators during times of high traffic at the Web site.)

We'll show you how to use the Refinancing Calculator for mortgages. After clicking the red text link, read through the instructions and scroll down the page. Then, begin entering the requested numbers in the text boxes, using the TAB key to move between boxes. For an explanation of any text box, hold your cursor over the text to see the definition in a black box near the bottom of the page. The calculated numbers will appear in the red boxes; you must click in a red box before the calculations will display.

Index. The site lists its individual pages by topic and subtopic through the Index link.

Message Boards. Site visitors can write and read messages for each other under a dozen topics through the message boards.

To read a message dealing with credit cards, click the Message Boards text link, then the plus icon next to the Credit Card topic. Click the Worst Credit Card Deals link to read messages under that subtopic. To read a message, click its title. After reading the message, you can read any replies made to the message by clicking the red hyperlinks near the bottom of the page. To reply to the message yourself, click the Reply link (it has a green arrow icon) near the top of the page.

To post a message, click Post link, marked with a pushpin icon, near the top of the page. After entering your name, E-mail address, and title of the post, type the body of your message in the large text field. Click the Post button to submit the message or, if you change your mind, the Back button to cancel the post.

Rate Alert. You can have bankrate.com send you an E-mail message when particular rates reach certain levels. However, you must register with the site first. After clicking the Rate Alert text, scroll to the middle of the page and type your personal data in the text boxes. Click the Next button. Then, click the check boxes of the newsletters and rate notices you want to receive, enter your E-mail address, and click Finish.

Today's Averages. The bankrate.com home page displays an abbreviated list of current rates. By clicking the Today's Averages link, you'll see the complete list of rates that bankrate.com samples, including mortgages, auto loans, savings deposits, and personal loans. For each type of rate, you will see today's average, last week's average, and the average six months ago.

To see additional information and news on any particular rate, click the rate's red hyperlink. For example, we clicked the text for a 30-year fixed

Rates & News

The latest news and information on a variety of financial topics are available through this section on the left side of the Web page. (Many of the links here are duplicated through the links at the top of the window.) We'll discuss the main links that we didn't discuss earlier.

Checking/ATM Fees. News, tips, and information about checking accounts and ATM fees are available though this link. To find the best checking and ATM fees available in your area, click the arrow in the Select A Product Below text box near the top of the page, select ATMS or Checking, and click Start. Choose your city (bankrate.com only includes major cities) to have bankrate.com return information on the accounts available in your area.

Credit Cards. No one should accept a credit card until they perform research through bankrate.com. You'll

find dozens of stories about credit cards here, including lists of the best rates and tips for avoiding unexpected fees. You'll find definitions for terms often used by credit card companies, too.

You can also use the Find The Best Rate box near the top of the page to find the perfect credit card for you. Make sure that All Of US is listed in the text box and click Start. On the next page, click the arrows in each of

the five text boxes and make a selection to narrow your credit card options. Then click Go. The site will return a list of cards that meet your criteria. Click any of the column headers to sort the list using that column.

Money Markets. After clicking the Money Markets link, you'll find information, news, and the latest yields for money market accounts. You can also use the text boxes near the top of the



Through the [Today's Averages](#) hyperlink, you can easily compare mortgage rates from banks in your area.

mortgage. On the subsequent page, bankrate.com gave us information and news stories on mortgages and home ownership. Near the top of the page, in the Find The Best Rate section, we simply clicked our state in the text menu and answered a few questions about our mortgage needs. In return, bankrate.com produced a detailed list of mortgage rates available to us as well as links to the Web sites of the banks in the list.

The bankrate.com Web site is one of several online publication sites from Intelligent Life Corp. In 1976, Intelligent Life Corp. started out as the Bank Rate Monitor, a newsletter that focused on the banking industry and provided consumer rate information to publications nationwide. (The

company's name changed in 1998.) In April 1995, Bank Rate Monitor transferred its information to the Web. (Intelligent Life still offers a print version of Bank Rate Monitor.)

In addition to bankrate.com, Intelligent Life offers other Web-based financial information sites, including

TheWhiz.com (<http://www.thewhiz.com>), which is aimed at young adults; Consejero.com (<http://www.consejero.com>), which is for Spanish-speaking users; and CPNet.com (<http://www.cpn.com>), which is a site for college students and the academic community. ■

page to search for a particular type of money market account.

Online Finance. Do you want to learn more about what types of financial management opportunities are on the Web? Just click the Online Finance link for news stories and information on the ever-growing list of opportunities for managing your finances online.

Small Business. Information about financial situations specifically for small-business owners, such as commercial mortgages, business credit cards, and paying for advertising, is plentiful under the Small Business link.

News Archives. You can easily access the hundreds of stories available from bankrate.com through the News Archives link. The site sorts the stories by topic, such as consumer banking, Year 2000, and personal finance. Just click the link for the story you want to read.

How To

The usefulness of the bankrate.com site depends on the ability of its visitors to find information that applies to their unique situations. This is why the links in the How To section of the Web page allow you to interactively work with the site's information.

Check Your Bank. Bank Rate Monitor uses data from the Federal Deposit Insurance Corp. (FDIC) and other government offices to analyze and rank 20,000 institutions. To check

the rankings of a financial institution, click the Check Your Bank link.

After reading the information on how the rankings are compiled, click the Go button near the top of the page. Then, select Banks/Thriffs or Credit Unions from the text box (just click the arrow in the box) and click Go. On the next page, you can search for institutions by one of five criteria: alphabetical, state, ZIP code, asset size, or number of stars. Once you specify the one method by which you want to search, click the Go button on the right.

You may then need to narrow your search slightly. Eventually the bankrate.com site will present a text menu list of each institution that meets the criteria you selected. Highlight one of the institutions in the list and click Go to see its rankings.

Define terms. If you're unsure about the meanings of financial terms used at the site, then click the Define Terms link. Click the topic for the terms you want to learn about.

Manage Your Credit. A poor credit rating will follow you almost everywhere, affecting several areas of your life. By following the Manage Your Credit link, however, you can learn how to improve your credit rating.

In the middle of the page, click The Basics link under the How Can You Fix Your Credit section. At the next page, you'll find several links that can help you determine the best method for improving your sagging credit rating.

Master The Basics. If you're a person who has little knowledge or interest in complex financial matters, then clicking the Master The Basics link will provide the basic information you need. Whether you need information on obtaining a mortgage or online banking, bankrate.com can help.

On the Master The Basics page, click the red text link for the topic you want. You'll then see a listing of stories you can read for more detailed information.

Watch Market Rates. The bankrate.com site compares several current rates, including the prime lending rate and the Fed discount rate, as well as rates from one month and one year ago. This gives you some insight as to where you should place your investments.

Browse Link Library. To find other resources on the Web that relate to consumer and small-business finances, click the Browse Link Library link. This will take you to a list of several Web sites, sorted by topic, that provide additional financial information. Click the topic you want and then click the Web site's link.

Another method for finding links to financial-related sites is by clicking the Partners link in the About area along the left side of the screen. Each of the listed businesses work in conjunction with Bank Rate Monitor to help consumers better manage their finances.

Monitor Your Finances

The variety of information contained at the bankrate.com site is unmatched on the Web. Properly navigating the links along the left side and top of the window is the key to gaining the most from your visit to the site.

Financial matters can be a major source of frustration for consumers, especially when they don't have all the information they need to make the best decisions. By using bankrate.com, though, monitoring finances is no longer mysterious. ■

by Kyle Schurman

*Estimated reseller price for models 39020U-70U. Actual prices may vary. mhz denotes microprocessor internal clock speed only; other factors may also affect application performance. gb=1 billion bytes for HDD capacity. PCs referred to in this ad include an operating system. IBM product names are trademarks of International Business Machines Corporation. Intel Inside and Pentium are registered trademarks and MMX is a trademark of Intel Corporation. © 1999 IBM Corp. All rights reserved.



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\$2,599*

power

mobile Pentium® w/MMX™
technology or Pentium II
processor 233 to 266 mhz

specs

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integrated floppy/cd, 12.1" or 14.1" TFT
display, optional 10/100 EtherJet card

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www.ibm.com/thinkpad or 800 426 7255, ext. 5040

Web Tips

Ideas That Make The Most Of Online Time

Experience A Conversion

You'll need to know the cost of living differences between Portland, Ore. and Milwaukee before your big move. And those metric instructions for the new deck you're planning will be much easier to tackle if they're converted to English. Calculator Cornucopia (<http://starnews.wilmington.net/starlink/calcs.html>) helps in both cases with links to an assortment of calculators that do the math so you don't have to. Perform fast conversions for cost of living, weights and measures, currencies, mortgages, and distances, among other units. Use the weather calculators to determine heat and wind-chill indices and have a little fun with the "How far as the crow flies?" calculator, which measures distances in terms as indicated by the title.

It's A Tools Paradise

Let's face it, in the 1990s, with rampant specialization and niche everything, it's hard to be a true Renaissance man. It's even tough to master everything in the local hardware store. Don't be ashamed if you don't know a drywall saw from a keyhole saw or a square-drive from a Phillips screwdriver. Pull up the Tool Dictionary at <http://www.sierra.com/sierrahome/home design/tool> and search the four categories for various

tools complete with names, pictures, and brief descriptions.

Go It A Loan

Get a jump start on the purchase of your next General Motors (GM) vehicle by applying online for financing. Visit GMAC Financial Services Financing Options at <http://www.gm.com/vehicles/us/finance> and press Click Here to use the Express Application. Provide your name, address, city, state, ZIP, E-mail address, phone numbers, and Social Security number, which authorizes a partial check of your credit history. GMAC has an E-mail link and an 800# to handle pre-application questions.

After submitting the application, you'll receive an Application Certificate via E-mail. Take it to the GM dealership when you're ready to buy and answer additional questions about your employment, salary, and residence. Once you've done this, your application will be complete.

Calling All Conferences

The right business seminar can save you time and money, but you usually spend a lot of both trying to find those seminars. ScheduleEarth (<http://www>

[scheduleearth.com](http://www.scheduleearth.com)) can help with its automatic calendar feature that fills you in on trade shows, seminars, training sessions, and meetings that meet the criteria you define. Say you want information for all litigation consultation seminars held between Sept. 30 and Nov. 29, 1999, in the Chicago area. ScheduleEarth will compile and post the information to your calendar. The site also features a free, Web-based calendar where you can post a dentist appointment in a private section or all association meetings for the next year to a public section.

Seven Minutes To Health

Despite screaming headlines about heart-healthy foods and disease prevention, we

results (also free). Enter personal statistics such as gender, date of birth, weight, height, blood pressure, cholesterol level; answer questions about your smoking, travel, and drinking habits; fill in gender-specific fields; and answer questions about your level of physical activity and nutritional habits. Click Show My Results and read the analysis.

Ready, Set... Charge!

A company can't do business online effectively without accepting credit card payments, and a company can't do that without having a merchant account. Setting up such an account isn't difficult, but as with many aspects of designing Web pages, the more you know, the less chance you have of making serious and costly errors. Read

"Accepting Credit Cards: Getting A Merchant Account," by Charlie Morris at <http://www.stars.com/Internet/Commerce/MerchantAccounts> before trying to setup a merchant account. In addition to practical information, Morris provides links to Web sites with sample credit-card forms, primers for Hypertext



ScheduleEarth will send up to five E-mail reminders of important events listed on your personal calendar.

often consider health problems to be someone else's problem. All invincible-feeling people should take the 7-Minute Checkup at HealthScout (<http://www.healthscout.com>). Scroll to Library and click on 7-Minute Checkup. Either join HealthScout (free) or simply take the test and get your

Markup Language (HTML, the code used to write Web pages), and Common Gateway Interface (CGI, the code necessary for interaction between a two operating systems over the Web) lists of recommended banks, and details about security for your Web site. ■

Defending The 'Net

Keep Spam Out Of Your Inbox

INTERNET SPAM, NOT TO BE CONFUSED with the fine meaty product from Hormel, is generally defined as unsolicited E-mail or postings sent en masse. You may consider it just "junk mail" that accumulates in your inbox until you delete it. But if you consider the millions of users online, all receiving unwanted ads every day, you can begin to imagine the hard drive space and Internet bandwidth consumed by spam. Like it or not, spam affects everyone online, but we can help you reduce your exposure to it.

Spamming The Globe

In the early days, online users communicated via bulletin board systems (BBSes) and their early in-house electronic mail (E-mail). Most of the traffic was from special interest groups posting messages, but when disagreements got out of hand, people started posting "flames" (or argumentative messages). Eventually, the flame wars spilled over into the personal E-mail. Because these early in-house mailboxes had limits of 10-30 messages, malicious users would repeatedly send an electronic message to a victim's mailbox until there was no more "room" to receive them.

Many online users were familiar with a skit by the British comedy troupe Monty Python, in which a group of vikings chanting "spam, spam, spam, spam, (lovely spam!)" in a restaurant eventually drown out everyone else's conversations. Thus, clogging someone's mailbox became known as "spamming."

Today's spam usually isn't an attempt to max out anyone's inbox. At its worst, it's messages trumpeting stocks, pornography ads, solicitous chain letters, or get-rich-quick schemes. Spammers often use provocative subjects to get you to read their message, such as "Hot Stock



Tip!," and some even fraudulently alter their message's header (listing of where it's been) to pretend it came from somewhere else. Sometimes their tactics are patently illegal but difficult to prosecute. "It's clear they're moving toward a new level of sophistication," says Ray Everett-Church, co-founder and counsel for Citizens Against Unsolicited Commercial E-mail (CAUCE; <http://www.cauce.org>).

With all of this in mind, we'll tell you how to reduce the spam you get in your inbox, and why the problems with spam are more than the inconvenience of deleting a few worthless messages.

What's The Harm?

It is easy to delete spam, so you may be wondering why it infuriates some people while it merely annoys others. For one thing, spam is a 'Netiquette no-no; for another, some of the messages invading your inbox may be offensive or disturbing, especially for young users. Finally, you probably didn't spend hundreds or thousands of dollars on a PC, modem, and Internet connection just to receive a deluge of junk mail.

These are compelling arguments, but the greatest harm from spamming is economic. The sheer volume of bulk E-mail slows down every Internet service

provider's (ISP) servers. With a click of a button, a spammer can send a message to hundreds or thousands of addresses. But each message must be routed through the spammer's ISP, your ISP, and any proxy servers in between (not to mention the fileserver in your workplace.)

While it is possible to block E-mail messages at any of these points, most ISPs normally don't screen for spam. This is because filtering would not only slow down its system's overall performance but also may let in either too much spam or exclude too many "real" messages.

Rich D'Amato, a spokesperson for America Online (AOL), estimates 5%-30% of AOL's E-mail traffic may be spam. This means its subscribers (and those of virtually every other ISP) could be enjoying much faster service if it weren't for spam.

How They Get You

"Be aware of how spammers get a hold of [your] E-mail addresses," Everett-Church cautions. Spammers either buy mailing lists or use automated programs (called robots or harvesters) to comb the Internet for E-mail addresses. They then send their sales pitch to their entire list in the hope of making money from a very few.

Some of the favorite hunting grounds for address-gathering robots are chat rooms, forums, and Usenet groups in which people divulge their E-mail addresses. If your loathing of junk E-mail outweighs the benefits of publicizing your address, don't do it.

Still, don't confuse spam with legitimate E-mail you've "asked" for. If you've ever entered an online contest, filled out a survey, or bought an item online, expect some E-mail from that company. The reputable ones let you "opt-out," or specify you don't want any mail from them; the nicest companies only contact you if you opt-in.

Avoiding Spam

A byproduct of our interconnected information age is that it takes a lot of effort just to be left alone. This is because there is a fine line between avoiding spam and missing legitimate messages. Still, there are several decisive steps you can take.

Protest it. Contact your state and federal legislators and make your feelings known. This is the only tactic that seeks to stop spam before it reaches your ISP.

Filter it. See "Trashing Spam" for some tips on filtering spam from various browsers. Just be sure to adjust the software's settings and test it for a few weeks to ensure it doesn't exclude messages you really want to receive.

Trace it. Look at the message's header (in Microsoft Outlook, click Help, Contents And Index, type headers, downloading, and then press ENTER. Next, follow the directions

find the spammer, there is a free, powerful program with many spam-hunting features called Sam Spade. You can download it from <http://www.blighty.com/products/spade>.

Type the spammer's address in Sam Spade's top entry blank, and then click the Whois icon. This feature may give you the name and contact information of the sender's domain. Other features, such as Finger and Traceroute, may help you pinpoint a trickier spammer.

Contact the ISPs. Ask your ISP if it uses spam-filtering software, such as MindSpring's Spaminator (<http://www.mindspring.net>) or other services.

Many unsolicited E-mails suggest you reply to their message with the word "unsubscribe" in your text if you're not interested. The suggestion may be legitimate and your name might be removed from a bona fide marketing list. However, it's more likely that by replying, you may encourage an unethical sender; after all, you've confirmed your

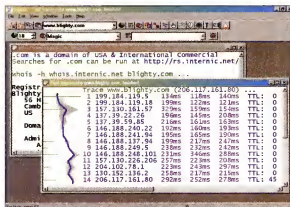
E-mail address is current and valid. Unfortunately, there is no easy way to tell which is which. If the spam continues from that source, your best bet is to politely complain to the ISP listed in the sender's address or uncovered by your tracing.

If the spammer's address is fraudulent, legal penalties are much more severe, and your own ISP (and maybe even the Federal Communications Commission or Federal Trade Commission) should be motivated to track down the offender. They may ask you to forward the spam to them with instructions

on preserving the spam's header.

Some activities may not be illegal, but may violate an ISP's terms of service. For example, EarthLink (<http://www.earthlink.net>) prohibits not only illegal activities such as hacking but also sending the same message to the same address more than 10 times. Your own ISP's regulations should be easily accessed from its home page.

Mung it. If you give your E-mail address when you post a message to a



Once Sam Spade's Traceroute sings like a canary, you can Finger the dirty rat sending you spam.

for downloading headers). You'll see a list of the servers the message traveled through to reach you. Generally, the last "from" in the list is the sender's ISP, but many spammers are knowledgeable enough to forge their "signatures." If you have no luck with the last ISP listed, try contacting the next one up, and ask for its help (see the next tip).

If you use Windows 95, Windows 98, or Windows NT 4.0, and you want to

newsgroup or sign up for something online, you are exposing it to the address-gathering robots mentioned above. Because they usually grab any word with an @ sign in it, put an obvious typo in your address whenever you're asked to enter it at one of these sites. (You're not reconfiguring your E-mail account, you're just putting errors into the address you give in public.) This is called "munging" (Mash Until No Good).

For example, if Paco@someISP.net wants to post an opinion somewhere, he could mung his address to read Paco@someISP_NO_JUNK.net when a site asks him to enter it. For personal responders, he could say "take _NO_JUNK out of my address to reply." Of

course, a spammer could take the time to do this but most won't.

Be aware that when you register for access to certain sites, they will send a confirmation message to the E-mail address you give. If you don't reply to this (or don't receive it because you provided a munged address), your registration won't go through. Unfortunately, some of these sites sell their lists of confirmed addresses to spammers and can promise there won't be any munged or false accounts. You'll have to rely on other methods of avoiding this spam.

Other Tips

- Make sure you have an up-to-date browser. Many early browsers were

lax about keeping your E-mail address reasonably private.

- If your ISP keeps a directory of members, don't let it publicize your E-mail address.
- Be wary of E-mail messages from sources you don't recognize.
- Don't spam the spammer. This ties up the ISPs even more, which defeats the whole purpose, and it could get you into trouble.

However indirectly, the E-mail you receive, including spam, costs you money. Don't resign yourself to paying for someone else's sales pitch. ■

by Marty Sems

Legislating Spam

Spamming closely resembles the illegal practice of advertising by fax. The cost of sending the fax is much less than the paper, electricity, and toner costs of the people receiving it, so they essentially foot the bill for the ad campaign. This is the chief argument against enterprising individuals who proclaim their right to advertise through unsolicited E-mail. Bear in mind that TV, radio, newspaper, and Web site ads are all paid for by the advertiser, but spam is paid for by you.

Enter the regulating hand of legislation. Many spam-related bills have been introduced on the state and federal levels, and some have already become law.

State legislation. In April, Virginia passed the Computer Crimes Act, which outlaws unsolicited bulk E-mail, the falsification of a message's header, and

any software that facilitates either. In California, sending spam to or from certain domains (after being told not to) is considered trespassing and can result in a \$50-per-message fine. Other provisions require advertisements to be clearly labeled as such, and they also must allow customers to opt-out of the mailing list.

As of press time, about a dozen other states are pondering the merits of their own antispam legislation, including Maryland, Texas, Wisconsin, and North Carolina. The North Carolina bill also would ban unsolicited bulk E-mail that is intended to overwhelm a computer or disrupt its operation.

Federal legislation. It appears Congress is also listening. A handful of bills that would regulate unsolicited commercial E-mail have been introduced in

both houses. In the Senate, the Inbox Privacy Act of 1999, if passed, would force spammers to honor domain owners' requests to stop sending unsolicited E-mail to the domain.

In the House of Representatives, the Internet Growth and Development Act of 1999 would back up the spam policies of an ISP with the force of law. A civil action by a service provider thus violated could cost a spammer \$50 per message or \$25,000 per day. In addition, the Internet Freedom Act would make it a crime to falsify a message's origins or distribute software designed to do so.

Legal concerns. One of the chief problems in drafting such legislation lies in determining its scope. The federal bills are designed to supercede state legislation and expand their jurisdiction. But by extension, the

jurisdiction of federal laws over the worldwide Internet is uncertain. Just as individual nations must come to grips with online material that is prohibited in their countries but legal elsewhere, the United States may have problems enforcing regulations against spam that originates in other countries.

The provocative portion of Virginia's antispam legislation is its assertion that it will apply to any Internet traffic that passes through the state. Because an enormous chunk of the world's online communication passes through the northern part of the state (because many major ISPs and servers are located there), the jurisdiction gauntlet has been decidedly thrown down.

The CAUCE Web site (<http://www.cauce.org>) offers a collection of updates on this turbulent legal scene. ■

Trashing Spam

Which Stops Junk Messages Better: Commercial Utilities Or Your E-mail Program's Built-In Filters?

DEPENDING ON HOW their products turn out, software developers can either be heroes or hapless inventors who keep creating stuff that no one really wants or needs. Unfortunately, most spam-fighting software falls into the latter category. It's not that we don't need good spam-fighting utilities—we do—but many programs don't quite fit the bill. Although they promise to check your E-mail account and delete spam before it even shows up in your mailbox, some programs live up to this promise better than others.

Spam-Fighting Methods & Utilities

There are three main spam-fighting methods. The first type compares incoming mail against a list of suspects. If the address matches a well-known spammer, the utility flags or deletes the E-mail message. The second type looks for common spammer tricks in the header of each E-mail message. The headers show where a message came from, who it's addressed to, when it was sent, what it's about (the subject), and the path it has taken to get to you, along with other information. By analyzing message headers, the spam-fighting utilities can spot several telltale signs of spam.

The third spam-fighting method is a hybrid of the other two. It analyzes the headers and checks them against a list of known spammers. The reason it combines both methods is because the first spam-fighting process is usually not effective on its own. Spammers generally don't keep their accounts in one place long enough to send more than one message, therefore, their chances of getting nuked by the first method alone are next to nil.

On the other hand, the last two methods can be quite effective. By looking for common spamming tricks (like not including your address in the "To:" or "Cc:" lines of a message, or including text like "XXX" in the subject line), these methods can easily identify most spam messages. And, by using a list of offenders, this hybrid method can make spam trashing even more effective. While it's true that most spam does not come from the same E-mail account more than once, there are also plenty of repeat offenders out there who are unimaginative, yet brazen. When they forge E-mail addresses, they often use the same bogus domain name that countless other spammers use. For that reason, spam-fighting utilities frequently watch for spam messages that originate from domains of ill repute, such as bulkads.com.

We looked at programs that fit into each of these three varieties, some that work as standalone utilities and a few that work as plug-ins for mail readers like Outlook or Eudora. Plug-ins should be less troublesome to use because, by incorporating the features into an existing mail reader program, you only have to use one program, not two. But the plug-ins never worked as well as the standalone utilities, therefore, all three of the programs we discuss in this article are standalones.

We tested the utilities by having them check one of our E-mail accounts that receives a lot of spam. We counted the number of spam messages, then noted the number each of



the spam-fighting utilities caught. Because some utilities will flag or delete E-mail just because the sender doesn't list an E-mail address in the To field, we also sent ourselves some mail with the address in the "Cc:" (carbon copy) and "Bcc:" (blind carbon copy) fields. We did this to make sure the utilities didn't react too aggressively. You wouldn't want to miss E-mail messages from friends, family, or employers, just because they sent a carbon copy message to you.

(NOTE: None of these utilities work with America Online. AOL users can't check their E-mail accounts without logging onto the AOL service, but those with accounts at other Internet service providers [ISPs] can use any mail reader that is compatible with Post Office Protocol (POP), such as Outlook Express and Netscape Messenger, to check their E-mail. Most spam-fighting utilities also use POP to access user mailboxes.)

SpamKiller 2.55. The best utility we tested was SpamKiller by Novasoft (\$29.95, free 30-day trial period; <http://www.spamkiller.com>). By looking at headers and a list of suspect domain names (such as bulkads.com) to check for spam, it caught 15 out of the 19 spam messages in our mailbox. That's one of the best ratios we observed.

In addition, it didn't delete the messages we sent to ourselves. It did flag them, however, noting that our address wasn't in the To field. That is one of SpamKiller's noteworthy features; it explains why it flags certain messages. So, if it flags something incorrectly, you can easily create an exception so that the utility doesn't flag messages from that person again.

SpamKiller is also user-friendly. Its interface is similar to Outlook Express and the various command buttons have captions underneath them that explain what they do. Plus, the basic spam-trashing functions were easy to use. SpamKiller even includes options to unsubscribe from mailing lists or send complaints to ISPs about spammers that have an account with them. Best of all, the price is right.

Unfortunately, SpamKiller was really the only worthwhile spam-fighting utility we found. There are others that also work, but we have some reservations about recommending them.

Spam Attack Pro 2.52. An honorable mention goes to Spam Attack Pro by Softwiz Software LLC (\$29.95, free 30-day trial; 800/828-5295, 818/610-0530; <http://www.softwiz.com>). It did a good job of catching junk E-mail—it trashed 16 out of 19 spam messages—but it was difficult to use. The interface wasn't quite as nice as SpamKiller's, and it seemed to have trouble downloading messages. Each time we tested Spam Attack Pro, it would only download two or three messages and then stop. We had to repeatedly click Check Now to download all the E-mail in our mailbox.

The utility also wasn't as easy to set up or as user-friendly as SpamKiller. First of all, the user interface is barebones. The utility controls all the functions through its pull-down menus at the top of the window. We also noticed some overkill in the way Spam Attack Pro filters E-mail. When we included our AOL address in the Cc line of some of the messages we sent to our test mailbox, Spam Attack Pro automatically deleted them. Granted, it is common for spammers to include the AOL domain in their junk mail, and the deleted messages aren't lost forever because Spam Attack Pro keeps a copy of them in the Retrieved Junk Mail window, but we still think this is a good example of a filter that needs to be a little more specific.

Spam Buster 1.62. At first glance, Spam Buster by Contact Plus Corp. (\$19.95, free demonstration version; 800/366-9876, 407/984-2592; <http://www.contactplus.com>) looks like a very thorough filtering utility. After all, it caught 18 out of the 19 spams in our mailbox. But, upon closer examination, Spam Buster appears to be rather reckless about flagging too many messages as spam suspects. For our tests, Spam Buster deleted all of the messages we sent to our mailbox because the address was in the Cc or Bcc fields.

The interface is also severely lacking. It's a small window with poorly illustrated buttons. To view a descriptive caption of each button's function, users must hold a cursor over each one.

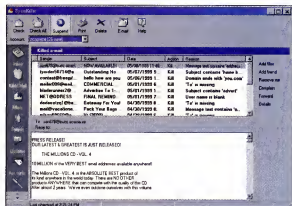
On the plus side, Spam Buster does include a way to preview messages to see whether they're really spam or not, as well as a way to add filtering exceptions. Spam Buster also explains why it flags or deletes messages. Not all spam-fighting utilities do this, but those that do make it much easier for users to find and turn off a certain filter that's flagging E-mail that's not really spam. One interesting (and ethnocentric) feature is its ability to block E-mail from entire countries. So, if you want to keep those pesky folks from Luxembourg from hassling you, Spam Buster is your hero.

Filter Out The Trash

All three of these utilities offer a free trial period or demo version. Many Internet shareware archives have them available to download. SpamKiller is at <http://www.spamkiller.com>, and Spam Buster and Spam Attack Pro can both be found at WinSite (http://www.winsite.com/ws_search.html).

As neat as some of these utilities are, each one adds yet another step to checking your E-mail account. Because the filtering capabilities found in most mail reader programs make these utilities unnecessary, we don't think they're worth the hassle. By configuring a simple mail reader filter to delete all E-mail that don't have your address in the To or Cc fields, you'll eliminate most spam. In fact, this method is more efficient than any of the programs we tested. Our mail reader caught all 19 of the spam messages; plus, it didn't delete any of the messages we sent to ourselves via another mailbox.

We couldn't create this type of filter for Outlook Express, but other programs, such as Netscape Messenger, Eudora Pro, Eudora Light, and Web-based E-mail services like Hotmail, all let us add effective filters. For instructions on how to create filters, see the related article in the July 1999 *Smart Computing*. ■



SpamKiller caught most of the spam sent to our mailbox and explained why it marked certain messages as spam.

by John Lalande

Working At The Worldwide Office

Our Australian Trip Tests Tools For Reaching Your Files & Messages From The Road

ACCESSING YOUR E-MAIL ACCOUNT, retrieving voice mail messages, and receiving numerous faxes and documents when you travel requires a great deal of forethought, be it across the country or overseas. Generally, as we discovered on a recent 25-day trek to Australia, the challenges you'll experience are directly proportionate to the distance you travel from home base, as well as the duration of your trip.

One of the daunting aspects of overseas travel is that you're separated from all of your stuff. This was of particular concern to us. After all, Australia is about as far as you can go from here—or at least from our starting point near Chicago. After we left O'Hare Airport, we were in the air a total of 22 hours, 14 of which were nonstop over the Pacific Ocean, before landing in Perth, Western Australia (our final stop after Sydney, Australia). And with several magazine articles and research projects in the works, we needed reliable access to several resources while en route and access to others when we arrived in Australia.

There are several key elements to consider when you're planning an extended trip and need to work while on the road: reliable equipment with the requisite features, mandatory applications and files, and external resources that you can tap into remotely and via E-mail. In addition, don't forget about planning for voice mail messages and the occasional fax that you won't want to miss.

Small Notebook Makes A Big Difference

If you're going to be on an extended flight, as we were, you'll want to make sure the aircraft you're traveling on has notebook power ports. Or, pack some extra batteries in your carry-on bag and take a notebook along that offers excellent battery life. We found out, for example, that Air New Zealand didn't have power ports on its 747-400 planes that fly between Los Angeles and Sydney so we needed to plan ahead.



One way to solve the battery problem is to purchase a portable power pack, such as one that's available from 1-800-Batteries, which is now labeling itself as "iGo: Solutions For People On The Go" (<http://www.800batteries.com>; 800/228-8374, 775/746-6140). This is a flat 12-volt lead acid battery that connects to your notebook PC via the PC's automobile power adapter. Although it's a little on the heavy side, it will give you five to six hours of notebook operating time. The battery, with charger, weighs about 3 pounds and is flat enough to fit into your notebook case. The charger, however, is an odd size so it's better to stow it in a suitcase or another carry-on bag.

After some research, we finally found a notebook PC that offers good battery life and a complete set of features. Compaq's Armada 3500 (<http://www.compaq.com>, 800/345-1518) is a super-thin Pentium II 333MHz notebook PC (\$3,350) with an optional expansion unit (\$430) that contains a DVD-ROM drive, stereo speakers, and a diskette drive. The expansion unit snaps onto the bottom of the notebook, creating a single, albeit thicker, notebook. On the airplane, we used the Armada without the expansion unit attached. Then, on the ground, when we needed a full-featured notebook and had access to AC power, we attached it.

We elected to leave our portable power pack (from 1-800-Batteries) behind, and instead, we packed two extra batteries for the Compaq Armada. On our trip to Sydney, we initially used the notebook for a little under three hours and drained the battery down to about 10%. After the in-flight evening meal, we popped the second battery in and worked for another couple of

hours. We used this battery intermittently through the remainder of the flight and for 15 minutes or so at the Sydney airport while waiting for our Perth flight connection. As it worked out, these two batteries offered plenty of power.

Packing For The Road

Our Armada 3500 came with Windows NT 4.0 and Internet Explorer 4.0 already installed but with little else. We went through our checklist of essential applications and added them to the notebook's software arsenal. One application worth noting for any computing traveler is Symantec's Mobile Essentials (<http://www.symantec.com>; 800/441-7234, 541/334-6054). This application makes it easier and faster for users to change modem settings for multiple locations, check modem connection problems, handle time zone changes, and save critical files.

Next, we connected our notebook to the local-area network (LAN) and copied the files we needed to the notebook's hard drive. Then, to mitigate the risk of losing files in the event of a notebook crash, we also used a Philips CDD-2600 CD-ROM recorder (<http://www.philips.com>; 800/531-0039) and a CD-R (compact disc, recordable) to save the same files and applications on a back-up resource. Adaptec's Easy CD Creator software (<http://www.adaptec.com>; 800/442-7274, 408/957-7274) makes this process a no-brainer. You can use Easy CD Creator to pack your favorite tunes on a custom audio disc, too.

We currently use Outlook 98 for managing contacts and handling E-mail. Again, for some additional protection, we copied the Outlook.pst file, which contained all of our contact data and E-mail configurations, to the CD-R, as well.

Making The Connection

Our regular dial-up home office Internet connection for E-mail is IBM Internet Connection Services

(<http://www.ibm.com>; 800/821-4612). And because IBM also has dial-up numbers throughout Australia, we elected to use it for both E-mail and Web access. A quick test from our home base showed that our U.S. connection was working. Furthermore, we verified through IBM Connection Services that we could access the Internet service provider (ISP) overseas using the same connection settings. This added service really simplifies things; so much, in fact, that you might even consider changing ISPs if you're planning an extended trip with multiple stops and need an ISP that can accommodate your needs in several locations.

Although Internet Explorer was already installed on the Armada notebook, we decided to download and install the 5.0 version, as well, because it includes the Microsoft NetMeeting component. If you're anticipating online meetings while on the road, consider using NetMeeting. You can download it free from <http://windows.update.microsoft.com> as part of the Internet Explorer 5.0 package. By dialing in to a private or public Internet Locator Server (ILS), also known as a Uniform Locator Service (ULS) or a Dynamic Lookup Service (DLS), you can chat online, share files, use a whiteboard, or conduct an Internet phone call or video conference.

Simply launch NetMeeting, and a wizard will guide you through the setup process. You will find several public ILS sites prominently displayed on the main screen of the NetMeeting application; simply select the one that suits your fancy. However, keep in mind that NetMeeting is a separate application that dials up your ISP based on your Internet connection settings, and then it connects to an ILS site. As a result, you do not have to launch your Web browser to make NetMeeting work.

Dial-up connections are generally too slow to accommodate both phone and video over the Internet. And with the phone functionality, there is some delay in the voice transmission. Still, it can save you money on those international phone call charges.

Plugging In Overseas

It wasn't until we arrived at the hotel in Australia that we confronted the different electrical and telephone standards. Line voltage varies by country, but it's generally 240 or 120 Volts AC. In Australia, the voltage is 240V 50Hz AC. The AC adapters that come with most notebooks are dual voltage and automatically recognize either 240V or 120V. And there's no problem with the alternating current of 50Hz instead of 60Hz because the notebook AC adapter converts AC to DC to give the notebook power.

With all of this in mind, you'll still need a foreign socket adapter that accepts the U.S. AC plug. We purchased an Australian outlet adapter for \$8 before we left from 1-800-Batteries, but you can often find them in other electronics stores. Remember, however, that there is a difference between a socket adapter and a voltage converter. The adapter simply lets you plug a 2- or 3-prong U.S. AC plug into the foreign socket.

The converter, which you will need if you have equipment that does not have dual voltage capability built in, actually steps down the foreign voltage to the U.S. standard of 120V.

The AC adapter that came with our Compaq Armada 3500 worked on either 240V or 120V. Still, we did need a 240V to 120V converter for some of our other equipment. We found one for \$25 from Walkabout Travel Gear



Compaq's Armada 3500 is a Pentium II PC that can make batteries last.

(<http://www.walkabouttravelgear.com>; 800/852-7085).

Telephones are now an international commodity, and the standard RJ-11 connector that you find on most domestic phones and modems is becoming more common in other parts of the world. Our hotel room in Australia even had an RJ-11 connector. Even so, we still ran into instances where we needed the \$15 phone adapter that we ordered from 1-800-Batteries. To be even more prepared, we also purchased a Modem Saver Kit for \$39. The kit includes a tester that checks the phone line voltage and polarity before you attach your modem. When the green light flashes, it's assuring you that it's a friendly line that won't fry your modem.

The first time we plugged in our modem at the hotel, we used the Modem Saver Kit to check the connection, then we dialed a local IBM Internet access number and were immediately connected without a hitch. In a couple of other locations where we stayed, we failed to get a connection. Later, we finally figured out that we had inadvertently reset our modem properties to "Wait For Dial Tone," and because the Australian dial tone is different than the one in the United States, our modem apparently didn't recognize it. Once we changed the setting, we were back in business. Although we were dialing via 56K-capable access nodes, our modem connection speeds varied from 42Kbps down to 21Kbps. The latter rate occurred on a particularly noisy hotel line.

Cheap & Easy Ways To Send E-mail

For us, the easiest (and most economical) way to stay in touch with friends, family, and business associates was via E-mail. But, because the ISP's servers control and store your E-mail messages, you'll need to make sure your ISP can properly identify you. To do this and access your E-mail account, you will need a user

ID and password. In our situation, we lucked out. IBM Connection Services had its own dial-up nodes in Australia, which meant the system immediately recognized (and could utilize) our IBM ISP mail settings.

Without access to your own ISP, you'll need to consider some alternatives for sending and receiving E-mail messages while on the road. For instance, consider having your ISP automatically forward your messages to another E-mail account. If you are visiting a friend or business associate, for example, you could have your mail forwarded to his or her E-mail address.

Another option is to set up an E-mail account on one

of the free Web-based public providers and have your mail forwarded to this address. There are a bunch of public Web-based E-mail providers out there, including Hotmail (<http://www.hotmail.com>), Juno (<http://www.juno.com>), Excite Mail (<http://mail.excite.com>), MailCity from Lycos (<http://www.mailcity.com>), Yahoo! Mail (<http://mail.yahoo.com>), and others. All you need for one of these services is an Internet connection and a Web browser.

Before selecting a service, though, you should check out how much storage space you're allowed. Storage is a big deal if you're sending and receiving large attachments, such as graphics files, and you mistakenly exceed the storage capacity of the service and some messages get dumped.

Foiling Phone Bills

The best way to control telephone expenses when you're out of the country is to eliminate phone calls. However, there are times when a phone call is necessary. If you plan to use traditional telephone services, use SutterTel.Com (<http://suttertel.com>; 888/277-0221, 509/585-1900) to check for phone cards that work overseas. If you want to call direct from your overseas hotel and bill the charges to your room, be sure to ask the front desk about the exact cost and any hidden fees.

If you plan to use the Internet for phone calls, all you'll pay for is Internet access. As we mentioned earlier, Microsoft NetMeeting has Internet telephony capabilities. The downfall is that you'll have to agree on a time when you can meet someone at a designated public or private IIS server. Web addresses for some public sites, including Microsoft hosts, such as <http://ils5.microsoft.com>, are listed in the NetMeeting application. When you log on, the name and E-mail information you listed when you set up NetMeeting appear on-screen along with other participants who are logged onto the same server. Users who have telephone capabilities are flagged with a loudspeaker icon next to their names. Click the person with whom you want to have a phone conversation, and they will receive a ring through their PC audio system. Then, all they need to do is click to answer.

Another recent variation of phoning over the Internet comes from IBM's Net2Phone (<http://www.net2phone.com>; 800/438-8879, 201/928-2990), a service that lets you call almost any regular telephone in the world for as little as 10 cents a minute. All you need is an audio-capable PC, an Internet connection, and Net2Phone's free software, which you can download from its site. To call a friend in another country, simply input the other person's phone number. The signal travels via the Internet until it reaches a Net2Phone server in the



Net2Phone saves you money by letting you call any phone in the world from your PC.

destination country where the phone call is then routed into that country's switched phone system. Calling any phone number in the United States between 7 p.m. and 7 a.m., Eastern Standard Time (EST), from anywhere in the world, costs 10 cents per minute. Likewise, if you place the same call between 7 a.m. and 7 p.m., EST, it will cost 15 cents per minute.

Direct Access To Home Or The Office

All recent Windows versions have dial-up networking capabilities. Using a variation of the same feature, you can also set up a host PC, even a LAN, so that you can connect to your home base from your notebook over phone lines. Naturally, the host PC will have to be on, with the modem set to receive calls. Products, such as Traveling Software's LapLink (<http://www.laplink.com>; 800/343-8080, 425/483-8088) and Symantec's pcANYWHERE (<http://www.symantec.com>; 800/441-7234, 541/334-6054) make this process easier.

Direct connections are okay if someone is watching your home base and you have security safeguards in place (such as a log-on password and timer-control modem settings), however, dialing in to your home office PC can have its drawbacks. The big risk deals with equipment failures and power outages. Unless you have auxiliary power, you're out of luck if there's a power failure and there is no one at your home office to reboot your PC. Moreover, direct dialing for this purpose still means paying long distance phone charges.

Nowadays, many on-the-road executives rely heavily on accessing their companies' intranets via the Internet. Since key information, including meetings, project schedules, and contacts are stored on the company's file servers, the user doesn't have to worry about dialing in to a specific server or remember that his or her files are stored in a particular physical place. And, for independent contractors, there are now

Web-based virtual office services that, for no charge or a small fee, will give anyone access to common tools and files from wherever they may roam.

For our trip, we decided to try out a virtual office. We chose HotOffice (<http://www.hotoffice.com>; 888/446-8633, 561/995-0005), a Web-based service. If you have an Internet connection and a browser, you can set up your own basic HotOffice in about 10 minutes after downloading the software. And, because the first 30 days are free, you can try it first to see how well it fits your needs before you start paying the monthly fee of \$12.95 per user.

HotOffice provides a private, yet shared, computing environment that's similar to a company intranet. And, it's available from any PC that has an Internet connection, anywhere worldwide. In the latest 2.0 version, HotOffice includes a Web-based group calendar that enables HotOffice users to keep track of appointments, schedules, projects, and tasks. It also includes a shared contact manager, as well as the ability to quickly publish documents from your PC to specified folders in your HotOffice space so that you can use them privately in the future or allow other members in your office to view and edit them. You can

we were out of country because we hired a temporary assistant to check faxes and voice mail and then place messages in a HotOffice folder.

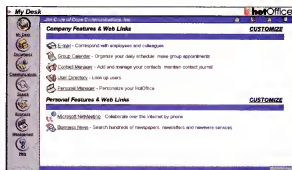
Travelers who don't require all the features of a virtual office, but still want to store and share files from a central point online, should check out My Docs Online (<http://www.mydocs.com>, 941/495-1181). Register by setting up your login name, password and your E-mail address and My Docs Online gives you 20MB of free password-protected storage on its servers. My Docs Online makes its money from advertising, and in the process, you'll have an off-premises "safe house" for your files. No special software is required—just use your Web browser.

A new product called Spiros from Cyrus Intersoft Inc. (<http://www.cyrus.net>, 612/331-6600), is scheduled for delivery this summer but was unavailable for evaluation during the research for this article.

The company's chief technology officer Daniel Berg describes Spiros: "Assume you're in Australia or some other country and you log onto a Spiros Center common server from an Internet café or an Internet kiosk at an airport. This brings up your personal settings—colors, your favorite applications, and so forth," he says. "For example, you may look for an application that lets you view Microsoft Word files that you have stored under your account on the server. All the applications are written in Java and download on demand from the server." Therefore, there is no need to actually install the applications on the PC you're using.

The key to remaining well-connected when you travel is pre-planning. Once you have a plan, make a checklist. Then, you can be ready at a moment's notice for that next trip across the country or to the other side of the planet. ■

by Jim Cope



Build yourself a virtual office by taking advantage of the online features available at HotOffice.

also have your mail diverted from your regular Internet E-mail provider to your HotOffice. There's even a virtual bulletin board for posting messages and a space for phone messages. Both of these features came in handy while

Are You A Spammer?

Make Sure Your E-mail Use Doesn't Become Abuse

EVEN USERS WHO GUARD their E-mail addresses find spam trickling around their fingers in the dam wall, threatening to become a flood if they ever drop their constant vigil. Asking spammers to stop the deluge rarely helps because the senders are typically experienced spammers with no reservations about clogging your inbox.

But many spammers would be surprised to find out their messages are considered junk. Perhaps even some of *your* messages are the ones aggravating folks on your mailing list. Identifying what constitutes spam is sometimes painfully clear, and sometimes it's a fine line. The following guidelines will help make sure you're not spamming in your personal and professional lives.

The Problem Defined

The PC Novice/Smart Computing *Computing Dictionary* defines spam as "unsolicited bulk E-mail on the Internet, or Usenet newsgroup postings sent to large numbers of newsgroups." Some users take it one step further and consider any unsolicited E-mail spam, but this is too loose of a definition. Being unrequested doesn't necessarily make a message unwanted. For example, most folks wouldn't consider an uninvited message from their high school reunion committee spam.

But the difficulties in defining spam mirror the effect that spam messages have had on the Internet. The term spam has even come to refer to the misuse of any tool. Computer gamers use it to describe others who use weak

points of a game's design to rack up extra points.

The junk mail description works quite well for our purposes. Spam consists of all those messages that you receive offering to sell you a product or a service. Even if you've asked for information you were generally interested in, spammers often share their contacts, so you might find yourself getting much more than you either wanted or expected. But junk mail doesn't always come from businesses. Other organizations and even friends may send you mailings that you don't care to receive. Even though they are not necessarily trying to sell you anything, they may be violating 'Netiquette, the (mostly) unwritten rules of Internet conduct. Below, we'll look at the more personal side of spam as well.

Business E-mail Gone Bad

A business that operates its marketing department by harvesting E-mail addresses from the Usenet newsgroups or World Wide Web pages and then sending out tens of thousands of messages with subject

lines overloaded with dollar signs is most likely aware that they're spamming. But what about a company that might be new to the Internet and simply sends out a press release covering a new product to their client list? How can you be certain that you're not spamming your customers?

First, you must be aware of the audience on the receiving end of your messages. If it's a mailing list that users elect to sign up for (and can just as easily sign off of), then that's not spam. But if it's an unrequested mass mailing, the spam buzzer should be going off. Do not send commercial messages to individuals who have not requested them.

Always provide an opportunity for customers to indicate their preference to receive or not receive future mailings from you. A good place to do this is the location where you ask for their E-mail address, be it software registration or at your Web site. Provide a checkbox that users can mark, telling you that they are not interested in product announcements, updates, and so on. Be sure to honor their requests. If you send them mail they don't want, you'll at best irritate them, and at worst, find yourself without the customer and maybe even the target of a lawsuit. Most forms of spamming are not yet illegal (although in October 1998, the first spammer was prosecuted in Washington state), but you don't want to be the case that future lawyers cite as an example to the judge.

Make sure that message recipients have a way out of a mailing list or E-mail alerts (short messages that keep users current on stock prices or other company information). Always include instructions on how to unsubscribe from your mailings in every outgoing E-mail message. Make sure the process of unsubscribing is simple, such as being able to simply reply to the E-mail message with the



word "unsubscribe" in the body or subject line. One current E-mail fraud tells spamees to call a phone number if they want to be taken off a list. Their call is then routed through Grenada or another international location, and they're charged \$20 or \$30 to their phone bill. Mailing list software makes it easy to automate unsubscribing, so don't make it any more difficult than it has to be.

For the most part, businesses that are spamming are well aware of what they're doing. A favorite tactic of on-line vigilantes is to spam back. They'll overload the mailing list servers of common spammers with large amounts of their own messages or even discover the E-mail addresses of company executives and sign them up with their own and other spam machines.

Businesses are the major transgressors of E-mail abuse, but individuals can be just as guilty as large corporations.

Home-Style Spam

Consider the E-mail tale of the young child who recovered from a life-threatening illness. It touched you so much that you want to share it with your friends, so you forward it to every person in your address book. Yes, you have just sent spam. It's clear that you're not trying to sell anything to the people who get your message. But they didn't ask for it, so think about what you're sending and who you're sending it to before you click the Send button.

We're not recommending that you should never forward messages. It's an easy way to pass along information exactly as you received it. If you're sharing jokes with friends who enjoy the messages you send, that's one thing. However, if the majority of messages you send are simply forwards to large groups,

you may be guilty of being a light spammer.

Think of E-mail as regular mail for a minute because that's essentially what it is. How would you feel if all the letters you received from friends and family were nothing more than photocopies of humorous stories or somewhat moving anecdotes, without so much as a personal "I thought you might enjoy this as much as I did" note enclosed? If the majority of your sent E-mail is impersonal, consider the impact from the recipients' points of view.

Another type of message that often gets forwarded to an entire address book is a virus warning. A large percent of these are hoaxes, and all you're doing by passing them along is perpetuating the unnecessary fear you felt. If you receive a message like this and are tempted to pass it along, check on the Web to see whether it's a hoax. A good place to look is the Computer Virus Myths page at <http://www.kumite.com/myths>.

Whatever you do, don't respond to or forward messages about making money fast by investing and then signing up others. These are pyramid

and make your unsubscribe process a simple one.

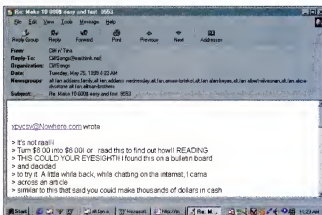
Spam first became a noticeable problem on the Usenet newsgroups, and it still makes some groups virtually unreadable. If you're a newsgroup user, whether for personal or business purposes, don't cross-post messages. Cross-posting refers to sending a message to more than one group, which lets a single E-mail message go out to virtually all of the tens of thousands of groups out there.

To Spam Or Not To Spam

Spamming may seem harmless because its effects are often invisible to the average user. Unless you are inundated with dozens of junk messages daily, you may be unaware of the problems that spam can cause. The mailings from one notorious spamming company for one month were estimated at 134 gigabytes (GB), taking up huge amounts of bandwidth (the Internet's capacity for transmitting information) and storage space. Spamming can bog down office and Internet Service Provider (ISP) mail servers, destroy newsgroups, and cost taxpayers money, which is one of the reasons there are dozens of state and federal bills being considered on how to deal with spam. Some experts say that unsolicited bulk E-mail, if allowed to grow unchecked, could render the entire E-mail system useless for legitimate mail.

It's easy enough to avoid being part of the problem. If you're looking for more information on what constitutes spam and what can be done to stop it, visit the Net-Abuse FAQs page at <http://members.aol.com/macabrus/faqs.html>. Or just send a message to everyone in your address book and all the newsgroups asking how not to be a spammer. They'll tell you quite swiftly and, maybe, harshly. ■

by Joel Strauch



The Internet's newsgroups have become inundated with spam messages.

scams and are one of the worst types of spam.

If you run a weekly newsletter or mailing list, the same etiquette applies to the individual as it does to a business. Make sure that your newsletter is going out to only those who request it

Pagers Get More Power

Don't Just Stay In Touch, Stay Connected

TEN YEARS AGO, if you became stranded on a desert island with only a pager, you might have received a message similar to "10-20." Even just a few years ago, text messaging might have been able to deliver the message "Where are you?" It's nice not to have to remember obscure codes, but text messaging could do little to get you off the island. Today, however, pagers have become extremely flexible communication devices. They can deliver news and stock prices to you, run software, and even allow you to send messages to others. Modern pagers can not only help you get off of that desert island but they also can keep you connected so you won't miss anything at the office.

It may seem like your cellular phone is enough to keep you connected, but you may want to make room on your belt for a new pager as well. Why do you need a pager if you already have a cell phone? Pagers are smaller and more discrete than most cell phones, which makes them preferable in many situations. They are also more functional than cell phones because they can easily share information with your PC, keep you up to date on important E-mail messages, and even run applications.

Beware Of Compatibility

While some of the features these pagers offer are amazing, it's important not to overlook your paging service. Both the pager service and the pager must support the same features. Pagers



vary widely in the number of messages they can store, the number of characters they can support per message, and the numerous miscellaneous features they have. Paging services vary just as widely. Most paging services sell or rent pagers that take full advantage of their features, so it's usually a good idea to get your pager from your paging service.

One-Way Services

Alphanumeric one-way pagers, which allow you to receive (not send) messages, come with a host of options and services and are much more accessible than the old numeric pagers. Those who need to reach you can do so by phone, E-mail, Web site, or even directly by modem using special software.

With the popularity of E-mail, it has become increasingly important to give pager users access to their E-mail messages. Most pager services provide a special E-mail account that forwards any message it receives directly to your pager. Your regular E-mail program should provide you with the ability to forward filtered messages to your pager

E-mail account. Depending on your E-mail program, you can either have all of your messages forwarded or only those from specific users. You'll never have to miss an important E-mail message again. A similar technology allows others to page you using a Web page. They simply fill in your ID number (your paging service will provide this) and then type a short message.

Most services also provide free news updates throughout the day from a variety of sources. PageNet (<http://www.pagenet.com>), for instance, uses news feeds from CNN, while SkyTel (<http://www.skytel.com>) uses content from sources such as Bloomberg and MSNBC.

Even though these are great services, there is one problem: character limits. Your paging service designs its updates with your character limit in mind. Not everyone, however, thinks of a character limit when they send an E-mail message. Your service will truncate any messages with more characters than the acceptable limit, and there is nothing more frustrating than losing part of a message.

With one-way services, these limits can be fairly small. SkyTel, for instance, has a 100 character limit on its SkyTel 5 one-way service. To put that number in perspective, consider that this sentence contains close to 90 characters. PageNet, on the other hand, allows for one-way messages of up to 500 characters.

Interactive Paging Services

While you can find all the previously mentioned features on older one-way pagers, the ability to respond

to pages is what really makes interactive (two-way) pagers stand out. These diminutive devices allow you to quickly respond to messages using a selection of custom-based responses or by creating an original response.

Of course, in order to create an original response, you have to be able to enter data. Some pagers, such as the Motorola PageWriter 2000 (<http://www.motorola.com>), have a small keyboard to enter data and navigate the menu system. Unfortunately, a keyboard adds size and weight to these devices. To keep this added size to a minimum, the keyboard necessarily has to be small, making typing a bit of a challenge. However, as difficult as these small keyboards may be, the alternative may be even more trying. Units such as the AccessLink II from Glenayre (<http://www.glenayre.com>) have an on-screen keyboard. While these on-screen keyboards may make for a more traditional pager size, they may test your patience when entering a message.

Response times (the time it takes for a message to be delivered)

can be very fast, depending on the pager and service you're using. Bell South (<http://www.bellsouth.com>) claims to have an approximate 10-second response time. It says it is fast enough that you can actually have reliable, real-time (operations that occur in a human's perception of time or proceed at the same speed as a physical or external process) chats with other Bell South users. Of course, the speeds will vary depending on the time of day and amount of traffic, but being able to chat with employees, supervisors, or customers is an invaluable capability.

Interactive pagers not only give you the ability to chat with other users and respond to messages but also the

ability to originate messages from your pager. You can send a message to any text-messaging pager (one-way or two-way) or to any E-mail account through your pager. Simply fill in the pager number or E-mail address, type your message, and press Send. Many of these devices include an address book to help manage phone numbers and contacts.

There are times, however, when you need to reach someone immediately. You can use your pager when you can't find a phone, but how can you be sure the recipient will check his or her E-mail right away? SkyTel's SkyWriter service provides text-to-voice capabilities so you can reach a contact as long as he or she is by a phone. An electronic voice will deliver your message and send you back a confirmation E-mail message.

Some of these advanced pagers, such as the Motorola PageWriter 2000, can not only share information with your desktop computer but also let you install a wide range of software. For instance, if you have a Motorola pager, you can download the Productivity Software Suite, which provides powerful features such as a calendar, task list, and even an alarm manager to help you use different alert

sounds for different events. Download this software at http://www.motorola.com/MIMS/MSPG/SmartPagers/pw2k/pw2000_software_upgrades.html. You can also download PocketGenie, which

will put the power of the World Wide Web in your pager, and StockBoss 2000, which gives you access to the most recent stock prices and market conditions. Combine all this with news updates from your pager service, and this device becomes a powerful tool that will keep you connected and informed.

The character limit for these services is much better than one-way services. Units such as the AccessLink II can receive messages as large as 500 characters,

and the PageWriter 2000 can receive a whopping 2,000 characters per message.

While monthly pricing is often competitive with one-way pagers, the cost of the pagers themselves are not. One-way pagers such as the Motorola Advisor Elite sell for \$135 through PageNet. Advanced two-way pagers, such as the Motorola PageWriter 2000, sell for \$360, and the service itself starts around \$25. SkyTel offers its one-way SkyTel 5 service for as low as \$24.95 a month for 500 messages (up to 100 characters per message). SkyTel's two-way SkyWriter service is also \$24.95 per month, but it allows for a 10,000-character limit (billed in increments of 10 character blocks). Note that message and character limits on two-way pagers apply to both incoming and outgoing messages, so be concise and encourage brevity in others.

There is no doubt that some of these super pagers are great for those who need to be in touch everywhere they go. Unfortunately, sending replies can sometimes be arduous and the response time isn't nearly as quick as using a cell phone. Not everyone needs one of these devices, but if nothing else, you'll look cool with one. ■

by Chad Denton



The Motorola CP1250 lets you receive 208 characters per message and can even display small graphics. The display can zoom from eight lines of text to four lines, making messages easier to read.



The PageWriter 2000 from Motorola does much more than just receive pages. This unit lets you respond to pages and even run numerous applications to increase your portable productivity.



WordPerfect 8.0

Using The Thesaurus

- Word Processing
- Beginner
- 8.0 for Win95

Do you ever envy people who possess an incredible vocabulary and can pepper their documents

with fresh alternatives to overused words? The secret to their success might be WordPerfect's thesaurus. This tool provides suggestions for words you might be able to replace in documents.

selecting the Custom option, so you can add the Thesaurus functionality.

Move the insertion point to the word you want to look up. Select Tools, Thesaurus to display the Thesaurus dialog box. Your original word will be displayed above the left-most column, which contains a list of possible replacements.

When an item in the third column is expanded, the columns will shift, replacing the left-most column as they slide over. Move between columns by clicking the left and right arrow buttons on the dialog box. Scroll within each column by using the scroll bars.

When you find the word you want to put into your document, click on it and then click the Replace button. You may be asked to select the correct word form (big, bigger, biggest). After making a selection, you return to your document automatically.

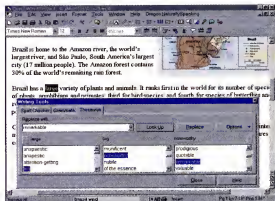
Prompt As You Go

The quickest method of finding synonyms is to use the Prompt-As-You-Go feature, which unveils suggestions while you type. Click Tools, then click Proofread from the Tools menu (Tools, Proofread) and make sure Prompt-As-You-Go is selected. As you type, or when you place your insertion point on a word, text will appear in the Prompt-As-You-Go box on the right side of the Property Bar.

If the color of the text in the Prompt-As-You-Go box is red, the word may be misspelled. If the color is blue, there may be a grammar or usage error. If the color is black, you can click the down arrow and select from a list of synonyms to replace the word. If the box is blank, there are no suggestions for the word.

Using The Thesaurus

Prompt-As-You-Go is convenient, but the word list it provides is not extensive. A more powerful tool for finding alternative words is the thesaurus itself. It should be noted that if you used the Typical option to install WordPerfect, some of the features described here will not be available. Reinstall WordPerfect, this time



Can't think of the right word? The thesaurus suggests alternative word choices.

If you used the Custom installation, there will be two columns. The second one will display word definitions, which are organized under parts of speech such as nouns and verbs. Initially, the definition of your original word will be displayed. Click a word in the first column, then click Look Up to display definitions for that word.

Definitions will be unavailable to users with the Typical WordPerfect installation. Custom installation users can click Options and deselect Show Definitions to cancel the definitions display if desired. Three columns will be displayed; the first will contain the initial list of suggested replacement words.

Double-click a word, or click it and then click Look Up to expand the list into the next column on the right.

Looking Up Words

As already mentioned, you can use the thesaurus to replace a word even before you have entered it into your document. For example, you might pause while typing, trying to think of a better word. Select Tools, Thesaurus. The columns will be blank. Type the word you want to replace into the Insert text box to display a list of alternative words.

Occasionally, the thesaurus has no alternatives for the word you are working with. Enter a different word into the text box and click Look Up or click the Close button to close the thesaurus dialog box.

Click the Options button in the thesaurus dialog box to display selections used to automate the thesaurus and to specify look-up options. The list will vary depending upon your installation.

By default, Auto Look Up and Auto Close are selected. When you open the thesaurus, it automatically looks up the word at the insertion point and closes when you click Replace or Insert. Use Options to select or deselect these options.

Clearly, the thesaurus provides a quick method of finding the right word with which to express yourself. With this tool, you should never be at a loss for words. ■

by Diane Kaye Walkowiak, M.A.

Lotus 1-2-3 Millennium Edition

A Look At The Latest Edition

- **Spreadsheets**
- **Beginner**
- **9 for Win95**

Lotus 1-2-3 Millennium Edition offers several enhancements over previous versions. The

most notable are improved file compatibility, built-in speech recognition, new Help features such as Ask The Expert, more Internet capabilities, and more than 50 new @functions.

Sharing Data

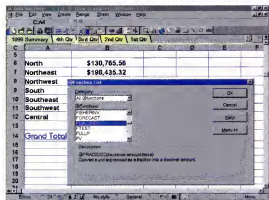
When you change an existing file, it is saved in its original format by default. This ensures that someone using an earlier version of Lotus 1-2-3 will receive a fully readable file from a Lotus Millennium Edition user.

In addition to supporting earlier versions of Lotus 1-2-3, the new edition supports a variety of document formats, including Microsoft Excel 97, Hypertext Markup Language (HTML), text, and graphics formats. Each worksheet can now have up to 65,536 rows rather than 8,192. In addition to providing for larger worksheets, this provides better compatibility between Lotus 1-2-3 and Excel. Users of Excel or previous versions of Lotus 1-2-3 can get further assistance by choosing Help Topics from the Help menu, then selecting the Contents tab and clicking What's New?

Users also can share data with other components of the Millennium Edition office suite, such as the Word Pro word processor and Approach database. Our next issue will show how to transfer information between Lotus programs.

Vocal Control

Data entry can be time consuming. Fortunately, the integration of IBM's ViaVoice means you can use your voice to enter data or issue worksheet commands. Click File, New Workbook, select Blank Workbook (Voice



The Millennium Edition contains more than 50 new @functions.

Enabled) as the SmartMaster template, then click OK. A microphone icon will appear in the upper-left corner to show that voice commands are active.

Speaking into a microphone, say, "Wake Up" to activate ViaVoice. You can enter data with your voice, and if you need assistance, say, "Show me Help." Turn ViaVoice off by saying, "Go to sleep."

Ask The Expert

The 1-2-3 Millennium Edition now supports the Ask The Expert feature available in other Lotus products. Click Help, Ask The Expert. Choose to

display information about a specific topic listed or enter a question in the text box and click Ask. Based on your question, the Expert will replace the list with Help topics that answer your question.

Internet Integration

The Internet's popularity and wealth of information make the transfer of data between it and your spreadsheet program essential. Lotus 1-2-3's linked Web tables let you deliver data from the Internet or corporate intranet into your worksheet.

You can assign 1-2-3's improved hyperlinks to a worksheet cell, object, or button. The hyperlinks can jump to a range or object in the same workbook, another file, or an Internet location.

Enhanced HTML features mean you can convert a workbook or selected range to HTML for publication on the Web.

Other Enhancements

Spreadsheet jockeys can never have enough @functions. The Millennium Edition includes more than 50 new engineering, financial, statistical, and other @functions for increased analytical power. Click the @function selector icon on the Edit line to see a list of available functions.

Formula building is faster and easier with SmartLabels, which now include more than a dozen predefined terms including Total, Subtotal, Grandtotal, Average, Minimum, Maximum, and Variance.

A Millennium Edition wouldn't be complete without providing for the next century. 1-2-3 is Year 2000-compliant and offers several options for entering twentieth and twenty-first century dates. For assistance with Year 2000 issues, click Help, Year 2000. ■

by Diane Kaye Walkowiak, M.A.



Web Browsers

Using Internet Explorer 5's What's Related Tool

• Online
• Beginner
• Internet Explorer 5.0

Most people know what they like, and they want more of it.

To help you find what

you are looking for, Microsoft included the What's Related button in Internet Explorer 5 (IE5) to point you in the right direction.

As part of a new breed of Explorer bar plug-ins, What's Related examines the site displayed in your browser window and provides a list of similar sites. To try it out, click the Tools menu in the menu bar and choose Show Related Links. A new window pane will open on the left side of the screen and load a What's Related page.

For some reason, this new window is actually a Search screen; the buttons at the top of the pane will pull up search functions that have nothing to do with What's Related. The content, however, is a list of 10 hyperlinks that have been selected by Alexa, which is a third-party information company. Click one of the links to see the page described. To close What's Related, click the small "X" at the top right corner of the new pane or toggle the Search button on the IE5 toolbar.

Those who like related information may want a quicker way to access the service. Instead of choosing the command from a pull-down menu, you can put it right on IE5's toolbar. Right-click anywhere on the toolbar and choose Customize. A new box appears with two windows; on the left side are buttons that are available for putting on the toolbar while on the right are lucky buttons that are already there.

What's Related languishes at the bottom of the left-side list. Scroll down and select it, then click the

Add button between the two windows. What's Related moves to the promised land. You can now change the order of the buttons if you like by selecting them and clicking the Move Up and Move Down commands. When you're finished, click Close. The IE5 toolbar should be sporting a shiny new What's Related button.

Gone But Not Forgotten

An interesting What's Related link you may occasionally see refers to the "archived" version of a page. As Web sites come and go, Alexa stores many of them in a private archive. Altogether, the company keeps about 12 terabytes (12 million megabytes) of data, which comprise approximately 1 million Web sites from the past. The next time you encounter a "404-Not Found" error while surfing, click What's Related to see if Alexa has the page in its archive. You may be able to read the page even though it no longer actually exists on the Web.

Another recurring link refers to Alexa's expanded version of What's

Related. To download this more full-featured component, click the link and wait for Alexa to automatically begin loading. A Security Warning dialog box soon appears; click Yes to accept the software. About 30 seconds later, a new browser window will pop up with additional instructions.

A new Alexa toolbar should appear on its own. If it doesn't, close all the browser windows and restart IE5. If you've changed any IE security settings, Alexa may not be able to load unless you temporarily switch them back to the defaults.

The Alexa window normally appears on the left side of the browser screen. Rather than simply showing related links, Alexa now features contact information for Web site producers, a number of statistics about site traffic and performance, and links to reviews written by other visitors.

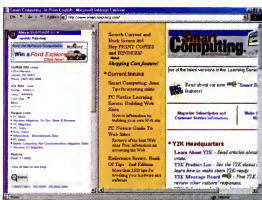
There is more information at the bottom of the Alexa window. Clicking a quick statistic or address in the Alexa window pulls up more detailed information in the main window. Here you can find explanations for all of the symbols and categories on Alexa.

Too Much Of A Good Thing?

To cut back on the valuable screen space dominated by the full version of What's Related, click the downward arrow in the upper-left corner of the Alexa window. Alexa disappears from the side of the screen and pops up in a smaller version along the bottom.

The expanded Alexa can provide interesting information, but it can potentially be very annoying because it automatically opens every time you start your browser. Return to the previous version by choosing Alexa in the Control Panel's Add/Remove applet. IE5 will return to its standard What's Related format. ■

by Alan Phelps



What's Related provides Internet Explorer 5 users a way to quickly find sites that have additional information about their favorite topics.

GIVE ME
ONE GOOD REASON
WHY

I SHOULD
INVEST
ONLINE
WITH



YOU
PEOPLE.

1. Backed by Morgan Stanley Dean Witter & Co.
2. 4-star rating from Barron's, 4 years running.
3. Access to our coveted Equity Research.
4. Free unlimited real-time quotes.
5. Free Thomson's financial research.
6. Customizable graphs.
7. We let you buy Treasuries 24 hrs a day. (A first.)
8. Commissions as low as \$14.95*.
9. Option to invest online.
10. Option to invest via touch-tone telephone.
11. Option to invest with a real, live human being.
12. Option to invest via voice-activated system.
13. 24 hour customer service.
14. Access to over 5,000 mutual funds.
15. Blue Chip Baskets. Buy 10 stocks for \$39.95.
16. No account maintenance fees.
17. *Your own personal finance home page.*
18. Easy portfolio download into MS Money[®] and Quicken[™].
19. Free access to Zacks Research.
20. Free Reuter's news links related to your holdings.
21. E-Mail alerts with Equity Research.
22. Place orders 24 x 7 x 365.*
23. Free interactive financial calculators.
24. Free demo to try before you buy.
25. Chart your budget with our interactive calculator.
26. Real time bid and ask prices for all U.S. Treasuries.
27. High level of internet security.
28. Free unlimited check writing.
29. Get real-time portfolio updates.
30. Free mutual fund selection tools.
31. No IRA setup fee.
32. No special software required.
33. Set up your own watch lists.
34. Free college planning worksheets.
35. Money market accounts, with tax-exempt choices.
36. See what your money's doing every second.
37. Customizable quote baskets.
38. Free IRA worksheets.
39. Buy and sell municipal bonds online.
40. So easy to use, your kids can help.
41. Optional online application to speed things up.
42. *Both Mac and PC friendly.*
43. We can help you roll over your 401k.
44. Free online retirement calculator.
45. Margin accounts for those who qualify.
46. Free automatic dividend reinvestment program.
47. We hold billions in customer assets.
48. We can help you set up a Roth IRA.
49. "Best Overall Online Broker"—SmartMoney, 1998.*
50. You did see number one, didn't you?

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HTML

Fancy Fonts

• Online
• Beginner

The problem with most fonts on your computer is that to use them successfully on

your Web site your visitors must have the same fonts on their computers. If they don't, users will still see your Web page, but they'll see it in their Web browser's default font and not the font you specified.

Core Web Fonts

In an attempt to widen the range of fonts that can be used on the Web, Microsoft distributes a range of free Web core fonts for the Apple Macintosh and the PC. The fonts are compatible with Windows 95/98, Windows NT, and the Macintosh operating system, and most are also available for Windows 3.x systems. The Web core fonts are Andale Mono, Arial, Arial Black, Comic Sans MS, Courier New, Georgia, Impact, Times New Roman, Trebuchet MS, and Verdana. You can download the Web fonts from Microsoft at <http://www.microsoft.com/truetype/default.asp>

Not all your visitors will have these fonts on their computers, but most will.

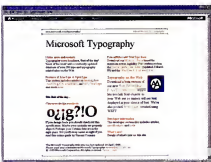
Setting The Face

The FACE attribute of the FONT tag lets you set the font face for the text it surrounds. You can specify one font or a number of fonts, and the browser will use the first it finds in the list. If a font is not found, the browser uses its own default font. The following tag sets the font to Verdana:

```
<FONT FACE="Verdana">Text in Verdana</FONT>
```

The following tag example will set the text to Verdana, or to Trebuchet if Verdana is unavailable on the computer system being used:

```
<FONT FACE="Verdana, Trebuchet MS">Text</FONT>
```



You can download the free Web core fonts from Microsoft's Web site.

It's critical that you type the font name exactly as it is named on your computer.

Setting Font Size

The SIZE attribute of the FONT tag lets you set the size of the text on your page. The sizes you can use vary from 1 (very small) to 7 (very large). Typically, the font size defaults to 3. The tag below sets the text just a little larger than the default size:

```
<FONT SIZE="4">This text is a little larger than the default size</FONT>
```

You also can set font sizes relative to the current size. This tag decreases the current font size by one size:

```
<FONT SIZE="-1">This is smaller than the current text</FONT>
```

Similarly, increases the text one size.

There is an additional tag, <BASEFONT>, that lets you change the size of the font for your entire page. This tag, placed immediately after the <BODY> tag, sets the size of the font for the entire page to size 4, which is a little larger than the default size:

```
<BASEFONT SIZE="4">
```

There is no closing tag for the <BASEFONT> tag. The BASEFONT tag doesn't work as expected in tables in the Netscape browser. The text in a table cell is not set to the size specified. Therefore, to change the size for type in tables, you must set the size in each cell.

Setting Font Color

You have two alternatives for setting font color on your page. First, you can set the color for the entire document using the <BODY> tag. For example, the following tag sets the color of the page's text to red:

```
<BODY TEXT=RED>
```

Second, you can set the color using the tag. This tag will change the text it surrounds to navy blue:

```
<FONT COLOR=NAVY>Navy type</FONT>
```

The simplest way to set the color is to use one of the 140 named colors supported by most of the recently released Web browsers. You'll find an excellent table showing colors, RGB values, and names at: http://www.htmlgoodies.com/tutorials/basic_cl.html

Stick to the Web core fonts, and both you and your visitors will enjoy the results of using fonts as a design feature on your Web site. ■

by Helen Bradley



Microsoft Excel 97

Putting Excel On Auto

- Spreadsheets
- Intermediate
- 97 for Win95

If you want to perform tasks more efficiently in Microsoft Excel, just reach into the program's bag of automation tricks. Excel's automation features will help you speed up normally repetitive procedures, such as typing the same entry again and again in a column. In this month's tutorial, we'll show you how to use three of these helpful features: AutoComplete, AutoCalculate, and AutoCorrect.

AutoComplete

You can use AutoComplete to avoid typing the same entry, such as a client's name, into a column more than once. To use this feature, type the first few characters of your entry. If the characters you type match an existing entry in the same column, Excel automatically displays the remainder of the entry. To accept the proposed entry, press ENTER. If the string of text doesn't match the string in another column, then keep typing to replace the "automatic" entry.

Instead of typing entries, you can also choose an item from a list. Select the cell for your entry and then press ALT-Down arrow to display a list of existing column entries. Use the Up and Down arrow keys to highlight the entry you want before pressing ENTER. You can also right-click the cell, select Pick From List, and then click the text you want to add to your column.

As you work with AutoComplete, note that the completed entry will match the uppercase and lowercase sequence of the existing entry. Additionally, Excel only completes entries that have text (or text and numbers); it

does not duplicate numerical, date, and time entries. Furthermore, AutoComplete only looks through entries in cells that are adjacent to the new cell and contain text. If a blank cell separates the new entry from the existing ones, AutoComplete won't work.

If you don't like the AutoComplete function, you can easily turn it off. To do this, click the Tools menu, select Options, and then click the Edit tab. To turn off AutoComplete, uncheck

INDUSTRY	COUNTRY	(M\$) SALES	(M\$) INCOME	(M\$) ASSETS	(M\$) MARKET VALUE	PERCENT RETURN ON INVESTED CAPITAL
Hotel	Australia	1150	273	452	39.9	12.1
Convenience	Brazil	715	114	144	95.4	1.6
Automobile	Germany	280	1269	2180	18.6	10.6
Electronic	Italy	96	2706	894	7.2	7.2
Steel	Japan	294	18036	8630	4.7	4.7
Optical	Norway	291	591	1430	9.7	9.7
Mechanic	Spain	1176	14714	16480	13.9	13.9
Accommodation	U.K.	180	8964	5415	7.3	7.3

In Microsoft Excel 97, you can use the AutoCalculate feature to quickly calculate the sum of selected cells.

the Enable AutoComplete For Cell Values box and click the OK button.

AutoCorrect

Notoriously poor spellers, sloppy typists, and people who want to save time will want to use the AutoCorrect feature. AutoCorrect works by automatically replacing common typing and spelling errors as you enter text. For example, AutoCorrect can change "hte" to "the" or automatically capitalize the word "monday."

To make sure this feature is on, choose AutoCorrect from the Tools menu. Next, confirm that the Replace Text As You Type box has a check

mark. While you are there, you can also scroll through AutoCorrect's built-in list to see which words it will automatically replace. When you finish, click OK. To test the feature, incorrectly enter a word on AutoCorrect's list into a spreadsheet and press the Spacebar. Excel will then correct your mistake.

You can also add words to the AutoCorrect list. For example, imagine you live in a town called Gallipolis. Instead of typing the town's full name each time you need to use it, you can create an abbreviation (such as Ga) for it on the AutoCorrect list. When you type the abbreviation, AutoCorrect will automatically expand to show the full name. To add a word to the list choose AutoCorrect from the Tools menu.

Then, type the word (or abbreviation) you want to replace in the Replace text box. Enter the replacement word in the With text box, then click Add. Choose OK to close the dialog box. In your worksheet, type the abbreviation followed by a space to quickly enter the replacement word.

AutoCalculate

Finally, you can use a spiffy feature, AutoCalculate, to quickly determine the total for a selected range. This gives you a fast way to check figures without having to create a formula. For example, you can sort (or filter) a list to show revenue from a particular client, then display the total income from the client.

To use AutoCalculate, simply click the first cell and then drag over the cells you want to total. Then, view the results on the right side of Excel's status bar. By default, Excel shows the sum of the selected cells. You can, however, quickly use a different calculation, such as Average, Max, or Min. With the cells still selected, right-click the status bar to display a shortcut menu, then click the formula you want. ■

by Linda Bird

Going Online

Find Yourself With The Internet

• Online
• Intermediate

Even in today's fast-paced world, taking time out to contemplate "you" might be as easy as clicking a few links. If you or your employer maintains a Web presence, if you're ever in the news, or even if you're simply listed in the telephone book, chances are you could find yourself staring at your own name etched in a computer monitor's haunting glow. Hunting down these online references (it often has been called "ego surfing") can provide clues into what the world knows about you.

Web Search

Self-search results can be surprising, either because you find more information than expected or, painfully for some, far less. The place to begin tracking mentions of yourself is with the same tool you use to locate anything else on the Internet, a friendly search engine.

Unless you think Yahoo! or some other directory maintains an entire category about you, your best starting point is a comprehensive search engine, such as AltaVista (<http://www.altavista.com>) or HotBot (<http://www.hotbot.com>) that scans through even obscure pages. Success may depend on the uniqueness of your name. Someone named John Smith is going to be hard-pressed to sort himself out from all of the other John Smiths out there in the world. This is one time when you may thank your parents for creative spelling.

A few measures can help stem an unwieldy avalanche of results. First, remember to put your name in quotation marks. This simple step causes most search engines to look for the exact phrase rather than words in any

order. The next trick is to run the search and see what happens. If you notice a lot of hits involving specific duplications, rerun the search using minus signs. For instance, you could ignore hits for Dr. John Smith with the query "John Smith" -doctor. Add as many restrictions as you need to eliminate pesky rivals.



Look for yourself at sites such as DejaNews. You may be surprised by what you find.

The opposite problem (not getting any hits) may not be as easy to solve. Be sure to try a variety of search engines because they don't all find the same pages. SavvySearch at <http://www.savvysearch.com> can make this job quicker by smoking through multiple search engines at once and tossing out the duplicates.

If search engine after search engine has trouble locating the real you, don't despair. We've looked for other names we knew for a fact existed on the Web yet failed to get noticed by search engine gatekeepers.

Personal 411

Anyone in the phone book should be able to score an easy hit at one of the Internet's telephone and address

directories. The information isn't always completely up to date, but people who haven't moved recently should find their own names pretty quickly.

The Web features plenty of directory sites these days. Two of our favorites include Infoseek (<http://www.infoseek.com>) and Switchboard (<http://www.switchboard.com>). These two sites and others like them seem to have fairly current information and provide more than basic white pages listings. For example, once you find your own name, you can check up on who else lives in the neighborhood or which pizza parlor is the absolute closest to your front door down to hundredths of a mile.

Perhaps the most surprising search for many people is a look through some of your online conversations. Don't worry, chat room transcripts aren't available, but public Usenet newsgroup and other message board postings generally are. If you occasionally contribute to these hodgepodes, load up DejaNews (<http://www.dejanews.com>) and search for your name or screen name. This comprehensive site should be able to pull up at least some of your messages.

Not everyone likes the idea that others can discover they spend a lot of time at, say, alt.fan.baywatch. So, if you don't want postings to show up in archives such as this one, add the line x-no-archive: yes to the beginning of your posts.

Rounding out our quick survey of your public persona, head back to HotBot and enter the universal resource locator (URL; a Web address) of your own home page in the search blank. Then choose Links To This URL in the first pull-down menu. Click the Search button and the engine will crank out all the pages that link to yours.

Still no luck? You could expand your search to various public records databases, but that could cost money and probably wouldn't provide an introspective window to your soul. ■

by Alan Phelps



Microsoft Word 97

Multiple Sections

- Word Processing
- Advanced
- 97 for Win95

By default, every Word 97 document contains a single section. If you select Page Setup from

the File menu and modify the margin settings, the changes apply to all of your pages. To create pages with different margin settings, you have two alternatives, both of which involve sections. Each section, which consists of one or more paragraphs, functions independently so that each can have its own margin settings.

To create a section, place the cursor in the desired location, click the Margins tab in the Page Setup dialog, click the down arrow to the right of the Apply To field, and select This Point Forward. Word creates a section break and applies the new margin settings to the newly created section. Alternatively, divide a document into sections using Word's versatile Break command.

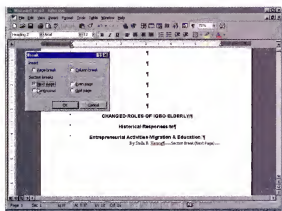
As well as section-specific margin settings, a particular section can sport a unique numbering scheme, header, and footer. A report could have a title page section with no footer; a table of contents section with pages numbered in Roman numerals; plus several topic-related sections, each with pages numbered in Arabic numerals.

Insert Section

To create a new section, position the cursor at the point where you want the new section to begin and select Break from the Insert menu. The Break dialog box appears, offering several options. Choose Next Page to start the new section at the top of a page, or

select Continuous to begin a new section without a page break. Text in a continuous section immediately follows text in the previous section.

The Even Page option in the Break dialog box directs Word to start a new section on the next even-numbered page. Word leaves an odd-numbered page blank if the new section falls on an even-numbered page. Similarly, the Odd Page section break option starts a new section on the next odd-numbered page, leaving an even-numbered



To create a new section, position the cursor at the point where you want to begin the new section, and then choose Break from the Insert menu.

page blank if the new section begins on an odd-numbered page.

Page Numbering

To delete the page number from a document's title page, place the page in a section of its own and position the cursor at the end of the page. Open the Insert menu and select Break, Next Page, and click OK. Then Click anywhere in the title page area, select Header And Footer from the View menu, and click the Switch Between

Header And Footer button on the Header And Footer toolbar. Word jumps to the title page footer. Delete any text or number from the Footer box.

To format page numbering for the section following the title page (for example, to create a table of contents), click the Show Next button on the Header And Footer toolbar. Word moves from the footer in section one (the title page) to the footer in section two. Type Page, press the Spacebar, and click the Insert Page Number button on the Header And Footer toolbar. Click the Format Page Number button, choose a Roman numeral number style from the Number Format drop-down list, then click the Start At radio button in the Page Numbering section, and select a page number from the list. Click OK. Make sure the Same As Previous button is not selected in the Header And Footer toolbar. Word numbers the section with Roman numerals.

To format page numbering for the third section, click the Close button on the Header And Footer toolbar. Insert a manual section break at the end of the second section and click anywhere in the third section. Next choose Header And Footer from the View menu. Then click the Switch Between Header And Footer button on the Header And Footer toolbar. Word jumps to the page footer in the second section.

To make the third section begin page numbering with "1," type Page, press the Spacebar, and click the Insert Page Number button. Then click the Format Page Number button. Choose the Arabic numbering style from the Number Format drop-down list, click the Start At radio button, select "1" from the Start At Page Numbering field, and click OK. As before, make sure the Same As Previous button is not selected in the Header And Footer toolbar. ■

by Carol S. Holzberg, Ph.D.

Quicken Deluxe 98

5 Tips For Experienced Users

- Personal Finance
- Advanced
- 98 for Win

Experienced Quicken Deluxe 98 users can tweak several aspects of the program to meet

their specific needs. Here are five helpful customization tips for users who are already familiar with Quicken.

1. Customized reports. You can customize Quicken's reports to include exactly the data you want. Open the Create Report window by clicking the Reports menu, one of the four submenus (Home, Investment, Business, or Other), and the type of report you want. In the Create Report window, click the Customize button followed by the Advanced tab.

You can now limit the data included with the report. For instance, in the Amounts text box, you could include only big-ticket items in the report by limiting the report to transactions greater than \$1,000. After you set the specific parameters for the report, click the Create button.

2. Memorized reports. Once you create a customized report, you'll probably want to save the report's features so you won't have to create the report manually again later.

In the customized report's window, click the Memorize button in the upper-left corner. In the Memorize Report window, type a title for your customized report. In the lower half of the window, select an icon for the report. Click OK to finish.

To later access your report, select the Memorized Reports command from the Reports menu. Next, in the Memorized Reports window, click the icon for the report you want to open.

3. Sharing information. Many people create customized lists of categories and accounts in Quicken. You

can easily copy these customized lists with other users' Quicken data files without sharing your actual account information.

Click the File menu, the File Operations submenu, and then the Export command. In the QIF Export window, click the Accounts List and Category List checkboxes to include them in the exported file. (NOTE: You'll need to click the Transactions entry to deselect it. If you don't, you will be sharing your actual transactions and not just your customized categories and lists.) At the top of the window, select an existing Quicken data file to which to export the categories and click OK.

If you would rather import these settings into a new Quicken data file, you need to create a new file by selecting the New command from the File menu. Next, select the New Quicken File radio button and click OK. Then, name the new data file and click OK. After that, click the File menu, the File Operations submenu, and the Import command.

In the Import window, click the Accounts List and Category List checkboxes (and deselect the Transactions entry). Select the file from which to import the data and click OK.

4. Tracking investments. To check the performance of your investments (which you've already set up in the Investment Register window), click the Features menu, followed by Investments and Portfolio View. If you need current prices, click the Update Prices button and the Get Online Quotes command.

Then, in the View text box, click the Performance command. Scroll to the

right in the Portfolio View window to see the percentage of return on your investments.

5. Sync your data. If you need to share your Quicken data between two non-networked computers, you can sync the two data files relatively easily via diskette.

Click the File menu, File Operations, and then Export. In the Export window, type a name for the export file, using the A: drive to save the file to diskette.

Then, click the name of the Quicken account from which you want to export the file in the Quicken Account To Export text box. Then, select the dates of the transactions you want to




Export your data to a diskette to share it among Quicken files on different computers.

export. For example, it might be a good idea to sync the two files once a month, meaning you could select August 1 through August 31. Finally, click the checkboxes for the data you want to export.

Click OK to save the export file to diskette. Now take the diskette to the other computer containing Quicken files and insert it into the drive. Open Quicken and click the File menu, File Operations, and then the Import command. In the Import window, type the name of the file you exported earlier to diskette. Click the account into which you want to import the data and the checkboxes for the items you want to import. (Click the Special Handling For Transfers checkbox to help prevent importing duplicate transactions.) Click OK. ■

by Kyle Schurman


Mega Bite!



Upgrade your freezer with world-famous Omaha Steaks Filet Mignons for only \$29.99! These aren't your ordinary supermarket steaks. Omaha Steaks Filet Mignons are aged to tender perfection and flash-frozen at the peak of flavor. Plus, they're delivered right to your door in perfect condition ... guaranteed! After just one bite you'll agree it's the best steak you've ever tasted. So add Omaha Steaks Filet Mignons to your menu today!

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Print Shop Deluxe

Create Individualized Certificates With Print Merge

- Desktop Publishing
- Advanced
- 6.0 for Win95

Print Shop Deluxe 6.0 makes project design easy by automating the process. To create personalized certificates, you have to complete only three simple tasks. First, create a name list; second, customize a ready-made certificate; and third, print the project.

Open Print Shop and select Certificates from the Select A New Project menu. Click the Personalize A Quick-Start Layout option and click Next. You will then need to select a theme. Before clicking Next, select a paper size from the Paper Size drop-down list. Insert the Product CD and select a QuickStart Layout. Clicking one previews the project in the window on the right. After choosing, click OK, and the selected certificate appears on the Design Desk, ready for editing.

Making A List

To print personalized certificates, you must create a list that Print Shop can use. Print Shop supports two types of lists: Address List stores names and addresses while Custom List prints labels with custom information. For this project, you'll use an address list.

To create an address list, choose Edit Address List from the Tools menu. In the Edit Address List form, click in the First Name field and enter a name. Use the TAB key to move to different fields and press SHIFT-TAB to move back a field. It is unnecessary to enter data in every field, but Print Shop stores address list information alphabetically by last name, so be sure you complete the Last Name field. To create an address list of company names, leave the First Name field blank, then enter a company name in the Last Name field.

Click Add Entry or press ENTER to add the name to the database, and a new blank form appears. After entering all your list names, click the OK button. Then, click Yes when Print Shop asks if you want to save the changes you made to the database. The Save As window will then appear, so enter a name for this list in the File Name field. Designate where you want to save the file in the Save In field, then click Save. Print Shop then returns to the Design Desk.

The next time you choose Edit Address List from the Tools menu, Print Shop opens the last address list file you created. To edit a name already in the database, choose it from the Select Entry drop-down list. Be sure to click the Update Entry button after making any changes and then click OK. Print Shop supports multiple address lists, but a project can merge information from only one list at a time.

Project Design

Once the Address List is complete, it's time to work on project design. Double-click a certificate text block and highlight its contents to make changes or to modify text block typeface, type style, alignment, or text color. If you double-click a headline text block, the Create A Headline window appears and lets you change the headline's face, shape, position, outline, depth, and proportion. Click OK to return to the Design Desk.

To merge a list of names with this certificate, double-click the text block that is to host the list field. If the text block is a headline block, you must

replace it with an ordinary text block. Right-click the headline, then click Delete on the pop-up menu. Click the Insert Text Block button on the Object toolbar to insert a new text block. Highlight the text you want to delete, then choose Insert Address/List Field from the Text menu. Click Address List and then click OK.

Click the First Name field from the Select Address List Field window and then click OK. The field inserts in your project as a placeholder in the text block. Press the Spacebar. Repeat the insert field steps to insert a Last Name field in the text block.



Insert Address List fields in a Print Shop project to print personalized documents.

Printing

Next, select Print from the File menu. Print Shop uses the most recently edited database list. Click the Change List button to ensure this database is the one you want. Click the Open Another List button in the Address window to choose a different list. Click the list entries you want to use for the individual certificates, then click OK. The preview window in the Print window shows how the inserted text fields line up with other certificate objects. Click Print or click Cancel to make changes. When ready, click Print, select list names, then click Print again. Print Shop prints a certificate for each selection on the name list. ■

by Carol S. Holzberg, Ph.D.



Microsoft Works 4.5

Doing A Mail Merge

- Integrated Software
- Advanced
- 4.5 for Win95

To make the most of a Microsoft Works database, pair it with the word processing tool and have Works address letters, envelopes, and labels. This is known as a mail merge because Works merges database information with a letter.

Here's how it works. In the letter, instead of typing names, titles, and addresses, you insert placeholders for the information from a database field. The placeholder appears in the word processing document as the title name enclosed in small brackets. Using either all the records from a selected database or only ones you specify, Works plugs information into the appropriate places for you to print.

We'll concentrate on the form letter, because once it's done the envelopes or labels fall into place. Open a new word processing document and begin typing the letter.

Second, with the cursor at the spot where you want to insert the information, click Database Field under the Insert menu. Click the Use A Different Database button, select a database, and click OK. If your database does not appear, you may have to click the Open A Database Not Listed Here button to locate it.

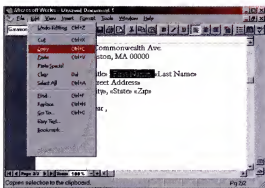
All the fields in the selected database now appear in the dialog box under Select A Field. Highlight any of them and click Insert. Use as many fields as you want; Works automatically places a blank space between placeholders. When you finish, click Close.

You can re-open the dialog box as often as you wish, and the document remembers which database you're using. (NOTE: You can only use one database at a time. To use multiple

databases, print one batch of letters, erase all the placeholders, change the selected database, and start again.)

Third, finish the letter, editing the placeholders as you wish. You can insert line breaks and punctuation and even cut, copy, and paste the placeholders as you would ordinary text.

Next, decide who receives the letter. By default, Works creates a letter for each record in the selected database. To change this, select Form Letters under



In a word processing document, the placeholders for database information are enclosed in small brackets. You can cut, copy, or paste these placeholders.

the Tools menu. A Form Letters window appears, now click the Recipients tab. If you've created filters for the database, you can select one. An easier option for a one-time mail merge, however, is to choose Current Records Visible or Currently Marked Records in the database.

To control which records are marked or visible, click the View Database button to jump to the database. In the List view, place a check mark in the left-hand column to mark a record, or hide a selected record by choosing Hide Record under the Record menu. When you finish, click the Go Back button.

To finish, you can print straight from the Form Letters window by clicking the Printing tab. Alternately, you can close the Form Letters window and select Print under the File menu. Just be sure to check the Print Merge option in the Print dialog box. Either way, you'll want to Preview your form letter, then click Print.

Envelopes And Labels

To create envelopes or mailing labels that match the form letters, first highlight the entire address—all the placeholders—in the letter.

When you choose Envelopes under the Tools menu, the highlighted information appears under the Main Address tab in the Envelopes dialog box, and the correct database should already be chosen under Database. Under Recipients, choose the same option as you chose for the letter. Double-check the return address and set the envelope size. Click the Close button, then the Yes button in the resulting dialog box to create the envelopes.

If you choose Labels under the Tools menu, specify that you wish to create labels and not multiple copies of one label. The highlighted information appears under the Label Layout tab in the Labels window, and the correct database

should already appear under Database. Under Recipients, choose the correct option, and go to the correct tab to set a label size. Click the Close button, then the Yes button in the dialog box to create the labels.

Once you've created your envelopes or labels, you can format them as you wish within the document. To print, select Print under the File menu. Select Envelope or Mailing Labels under What To Print, and check the Print Merge option. Preview them if you want, or just start printing—and stamping your stack of envelopes. ■

by Sarah D. Scalet

Quick Tips

Secrets To Succeeding At Common Tasks

Viruses

✓ Because nasty viruses are running around on the Internet, it is important to find out who sent you an E-mail message before you open it. Although true acquaintances can inadvertently send you viruses, some E-mail messages with viruses, such as the Melissa virus, appear to have come from someone you know. One rule you can use to decrease your likelihood of becoming the target of an E-mail virus is not to open E-mail messages from senders you don't know. Think of your E-mail account as another telephone. Like your telephone number, you give your E-mail address to those from whom you wish to get messages, so don't feel bad deleting those that come from unknown parties—it's easier than hanging up on an unwanted call.

Presentations

✓ Portable projectors have dropped in price dramatically, making them an af-

fordable presentation tool for the road. When you get ready to buy a new projector, there are two features you must have: a zoom lens and a wireless remote. A zoom lens will let you alter the projected image without having to physically move the projector into a client's desk space. The wireless remote gives you the freedom to walk about the room without being tied to the projector, and it doubles as a mouse pointer so you can open presentation programs from the other side of the room.

Multimedia

✓ That sparkling new monitor may have been shipped with an internal microphone, but if your plans include conducting some voice dictation or videoconferencing software to your PC, invest in an external microphone. Although internal microphones are fine for occasional voice messages, external microphones excel at producing higher-

quality voice data. In addition, external microphones are typically portable, so you can relax at your desk while holding the microphone.

Desktop Systems

✓ If you are looking for a new PC and the machines for less than \$799 appear enticing, look again to see if the system comes with a monitor. Most of the low-end PCs do not ship with a monitor, which gives you the option finding a monitor you like. If a monitor does ship with the system, then make sure you do a little homework on it first. For example, you may want to find out the model name and number and then go check it out at your local computer store. To keep prices low, manufacturers may include a 14- or 15-inch monitor with a low-end system, but that doesn't mean it is a high-quality monitor.

Digital Cameras

✓ Web cams, also known as desktop digital video cameras, typically sit atop a computer monitor, focusing straight ahead on one person or object. If you want a Web cam with more versatility, look for a model that has a shutter button on the camera and connects to the computer using a long cord. The combination of the long cord and shutter button will allow you to move about and take still images with the camera away from the computer. Cameras without a

shutter button force you to use the computer's mouse or keyboard (instead of the shutter button) to take still images, limiting the type of shots you can capture.

✓ Get the most out of your digital camera photos by printing pictures on quality photography paper, rather than your regular inkjet or laserjet paper. Start with a small pack of the paper, then play with your printer's configuration options. Choose various print qualities, such as low, medium, or high and be sure to specify the paper type, such as Hewlett-Packard photography paper. Altering these settings will definitely make a difference in your final product.

PDA's

✓ Palm-sized devices that have E-mail capabilities often present a problem: There may be no underscore on the on-screen keyboard or in Graffiti handwriting recognition software. This means you cannot send an E-mail message to someone whose E-mail address includes an underscore, such as `jane_doe@smartcomputing.com`. To get around this, you can type the E-mail address into a desktop computer's E-mail address book and then synchronize it with your personal digital assistant (PDA). The E-mail address will then appear in your PDA's address book with an underscore. This means you can send an E-mail message to this address by accessing the address book, copying the

Cameras with shutter buttons, such as Vista Imaging's VICAM-USB, support flexible photography.



address, and pasting it in the To area of the E-mail message.

Hardware

✓ The more devices you plug into your computer's serial ports, the more likely something will not run. Some serial communication (COM) ports share interrupt request lines (IRQs), which allow the computer to prioritize the information from those COM ports. For example, COM ports 1 and 3 share an IRQ, as do COM ports 2 and 4. Devices plugged into COM ports with the same IRQ may not function together. Also, they may conflict with the modem, sound card, or network card IRQs. To correct these problems, try switching the hardware devices to COM ports that do not share IRQs. If you use a serial mouse, try switching to a PS/2 mouse, which does not use a COM port and communicates with the computer through a different IRQ.

✓ In the event you need to reinstall hardware devices and no longer have the driver software to do so, many manufacturers offer driver software for their devices within the File Transfer Protocol (FTP) areas of their Web sites. Most manufacturers offer these driver downloads as a free service. You can download these drivers via the Internet in just a few moments with a standard modem. Some drivers come as self-executable (.EXE) files that install

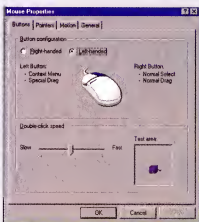
themselves with just a click, while others you will need to install through Windows. When downloading drivers, it is a good idea to save them to a folder (directory) within your computer's hard drive or removable storage media where you can quickly retrieve them.

Pointing Devices

✓ Lefties have to reach across a two-button mouse to click the left button awkwardly with their pointer finger. There is, however, a solution. You can reconfigure a two-button mouse to become a lefty friendly mouse. Open the Start Menu, move up to Settings, click Control Panel, and then double-click the Mouse icon. In the Buttons tab, click on the arrow in the first box and select Context Menu/Alternate Select. Then in the third box, select Click/Select. Then click OK. Once you make your change, the right button will probably (depending on your settings) click, drag, and select, while the left button will produce a text-sensitive pop-up menu.

DOS

✓ If you are a DOS lover and run DOS applications in Windows NT, you have probably noticed that these programs do not appear on a full screen. To put them in



In Windows 95 and 98, it is easy to configure your mouse for left-handed use.

full-screen mode, open your application and press ALT-ENTER. If you want to toggle back to Windows, press ALT-ENTER again.

Microsoft Excel

✓ If your fingers are sufficiently dexterous, you should have no trouble using hotkeys to enter the date and time into cells in Excel. Press CTRL-; (the CTRL and semicolon key) to insert today's date or press the SHIFT-CTRL-; key combination (the SHIFT, CTRL, and colon key) to input the current time into your Excel spreadsheet.

Portable PCs

✓ One of the biggest gripes about portable computers is short battery life. That's why it's important to use every trick you know to conserve valuable juice. One easy juice-saving method is to always leave a CD-ROM in your CD-ROM drive (if you have one). This saves your battery because Windows 95 constantly

spins the drive (which means it is using battery power) to see if there's a disc inside. If it checks and finds a disc there, it will stop looking, even if you're not using the CD-ROM.

Lotus 1-2-3

✓ In the Millennium Edition of Lotus 1-2-3, you can easily convert your workbooks or a selected range to Hypertext Markup Language (HTML, the language of the Web). To do this, click File, Internet, Convert To Web Pages. Enter a file name for the Web page, indicate what you want to convert, what format to use, and then click Next. Select HTML layout options, such as a header or table border, then click Next. To finish, preview and save your converted file.

Web Browsers

✓ If you have Netscape Communicator and you want to create your own Web page, turn to Composer. It offers a dozen basic Web page templates to help you design a Web page. First, open Composer by clicking the Communicator menu and then the Composer command. From the File menu, select New, then Page From Template. Next, click the Netscape Templates button in the dialog box, which will take you to the template Web site. To use a template, select one from the list and click Edit Page from the File menu. Once the page displays on-screen, editing it is as easy as working in your word processor. ■

Focusing On Digital Cameras

Today's Models Offer Ample Reason To Break From The Tradition Of Film

THERE CAN BE LITTLE DOUBT that George Eastman knew he would forever change the way we recorded events—be they historical or personal—when he introduced the Kodak camera in 1888. With the appropriate accompanying slogan, “You push the button—we do the rest,” Eastman’s introduction kicked off an era of supplying easy-to-use snapshot cameras to a mass market.

It’s less likely Eastman could foresee that the first commercial roll of transparent film his Eastman Kodak company would introduce a year later would someday become unnecessary to capture an image. With the advent of the digital camera, that’s exactly what has transpired just more than a 100 years later. Just as Eastman revolutionized the way we freeze historic moments with film, digital cameras are stirring up a revolution of their own.

As with other technologies that promise to make our lives easier and more productive, there is a temptation

for consumers to scurry out, buy a digital camera, and start snapping pictures. But, like any other significant purchase, there are some things you should be aware of before rushing home with the latest model. In this article, we will detail why digital cameras are creating such a buzz, how they operate, considerations when buying one, and some pros and cons.

Setting The Scene

Digital cameras make buying film and developing prints unnecessary. Instead of film, a digital camera uses a light-sensitive charge-coupled device (CCD) or complementary metal-oxide semiconductor (CMOS), each of which contain an array of pixels, or picture elements.

As light hits the pixels, the CCD or CMOS transforms the image into a current that transmits to an analog-to-digital converter (A-D converter), which converts analog information into digital information. Digital cameras then use software to compress the image and store it in the camera’s internal or removable memory as a Joint Photographic Experts Group (JPEG) file or FlashPix file.

Certainly, eliminating the need for film has contributed to the soaring popularity digital cameras are currently experiencing. But an even more important factor as to why more than 5 million digital cameras were purchased worldwide by the end of 1998 (according to an estimate by InfoTrends Research Group) lies in the realization that digital cameras produce exactly what most of us desire—instant gratification.



With a 1.5-inch to 2.5-inch liquid-crystal display (LCD) panel located on the back of nearly all models, users can frame and preview a shot before they decide to snap it. And, once an image is captured, users can review it almost immediately on the LCD. If the photo is a keeper, users save it in memory; if not, users can instantly delete it. Essentially, this type of control means that users no longer have to wait to see if those graduation, wedding, or birthday photos really turned out.

"Digital photography fixes almost everything that's wrong with film photography," says David MacNeill, editor-in-chief of *Digital Camera Magazine*, <http://www.digicam.com>. "Sending rolls of film to be processed is like doing all your laundry at the dry cleaners. It's a loss of control over your personal life, and it's expensive. There is just no way that some 16-year-old flunky at 'One Hour Photo' knows more about what you want from your pictures than you do."

In fact, image-editing software is bundled with nearly every digital camera on the market. This software lets users make adjustments for brightness, contrast, tint, and other defects. In addition, most image-editing software packages have applications that let users actually change the content of an image; add special effects; and create postcards, calendars, transparencies for T-shirts, and other projects. For more information about image-editing specifics, see "Photo Fixer-Uppers" in this issue.

"To me, the best part is being able to edit out the bad shots as soon as they are taken," MacNeill says. "And for the remaining good shots, you can always improve them in an image editor if you want to. You have total creative control."

Why Buy Digital

Besides eliminating costs and manipulating images, digital cameras are convenient and adaptable. Within minutes of snapping a digital image, users can transfer it to a PC or laptop;

attach it to an E-mail message; and send it to friends, relatives, or business contacts around the world. Anything is possible with digital cameras, from immediate photos of your grandchild's birthday party to instant images of that piece of property you want to buy. Each occasion can produce photos that arrive in your hands within the hour, rather than days or weeks.

"The appeal of digital cameras comes from their immediacy," says Denys Bouton, managing editor of *megapixel.net*, <http://www.megapixel.net>, a monthly online digital imaging

magazine based out of Vancouver, British Columbia, Canada. "This immediacy is not only provided by the LCD screen they usually sport, but by the fact that you can preview, review, delete, choose, and print their images quickly from a computer."

In addition, digital photos have become vital to enhancing World Wide Web pages, documents, presentations, and newsletters. Representatives from various industries have used digital cameras for years to produce instant images and enhance company sites, including insurance agents, police officers, real estate agents, newspaper

Creating Pictures Out Of Pixels

A digital camera is basically its own mini photo lab. The camera captures images using a light-sensitive charge-coupled device (CCD), which contains an array of pixels, or picture elements. As light falls on the pixels, the CCD transforms the images into a current that travels to an analog-to-digital converter (A-D converter), which converts analog information into digital information.

The digital data then moves to a digital signal processor (DSP), which processes the images, compresses them, and sends them to the camera's storage medium (a CompactFlash or SmartMedia memory card or diskette). There, the images are generally stored as Joint Photographic Experts Group (JPEG) files or FlashPix files. Next, users move the images to a computer transmit via a card reader, serial cable, or diskette drive. Users can then edit the photos and use them for various applications. ■



journalists, NASA personnel, crop management specialists, and hospital personnel.

These applications are helping create some impressive numbers. According to a survey of 500 registered digital camera owners, conducted by InfoTrends Research Group, 94% would recommend digital photography to a friend. Another InfoTrends study shows that digital camera shipments are growing 43% annually worldwide, with the market expected to surpass \$4 billion in sales in 2002.

Michelle Lampmann, a representative from InfoTrends, says there were an estimated 2.5 million digital camera owners in North America in 1998. And, she says, sales are expected to reach the 5-million mark by 2002. In addition, according to Lampmann, experts predict North American revenues will grow from about \$813 million in 1998 to \$1.5 billion by 2002. Conversely, film-based camera sales in North America have topped out at about 15 million units during the past few years, she says.

(For specific pricing information regarding digital cameras, see the Pros & Cons section of this article. The sidebar on this page provides additional pricing resources as well as other purchasing considerations.)

Besides convenience, digital cameras are becoming more adaptable by providing functions that film-based cameras have long offered—as well as some features they don't. In essence, newer models give users more creative control over focus, white balance, shutter speed, aperture, flash, and exposure settings. Although most of these functions were automatic in previous digital camera

consumer models, newer models now elect to offer both automatic and manual controls. As a result, users can now choose between point-and-shoot simplicity and manual control functionality.

The simplicity and adaptability characteristics contribute to the huge growth rate digital cameras are experiencing, says Joe Runde of Eastman Kodak's imaging department. "An increasing number of users are looking to digital cameras, because if you make it fun and easy to use, they want to use it. Just like computers."

Besides ease of use, the less-than-standard features and image quality equal to that of film in newer digital models may push sales and revenues even higher. In addition to capturing still images, cameras such as the Casio QV-7000SX and Sony MVC-FD91 record mini movies, while the Kodak DC260 Zoom and Minolta EX Zoom

1500 include the FlashPoint Digital operating system to let users customize the camera and perform preset functions. The Olympus D-620L has a threaded lens that accepts external lenses and filters, while the Agfa ePhoto 1680 has a 280-degree rotating lens for taking self-portraits and shots at difficult angles.

Newer models frequently also include optical and digital zoom lenses; slow-synch flashes for low-lighting conditions; and continuous shooting and burst modes for snapping several images at a time. Plus, digital cameras now often offer various image settings for landscapes, sunsets, and night shots; fluorescent and tungsten lighting; monochrome, negative, illustrated, and antique tones; and panoramic shots up to 360 degrees. Other features that are becoming more common include self-timers, built-in speakers and microphones to add sound to images, and the ability to impose text, date,

What To Look For In A Digital Camera

Before buying a digital camera, it's a good idea to find out what experiences amateurs and professionals have had with particular models. Several excellent Web sites are available with reviews, specifications, prices, and advice for using and buying a camera.

Check out the Digital Camera Resource Page (<http://www.dcresource.com>), Steve's Digicams (<http://www.steves-digicams.com>), Imaging Resource (<http://www.imaging-resource.com>), megapixel.net (<http://www.megapixel.net>), Digital Photo Corner (<http://www.dpcorner.com>), and the Digital Eyes (<http://www.image-acquire.com>).

Another fine resource is the Active Buyers Guide

(<http://www.activebuyersguide.com>). Using the site's Prioritizer, Customizer, Optimizer, Personalizer, and Decision Maker, you can compile a list of cameras that best suit your needs, based on the criteria you enter.

If you want digital images, but you don't want to buy a digital camera, there is an alternative that will soon be available sometime this summer. The EFS-1 from Imagek (<http://www.imagek.com>) is an electronic film cartridge that loads into standard 35mm point-and-shoot or Single Lens Reflex cameras. You can use it to store 24 digital images and then transfer those images to a computer with its bundled carrier that's available for Universal Serial Bus (USB), Small

Computer System Interface (SCSI), or serial ports. The EFS-1 is expected to cost less than \$800, and its cartridge can be reused thousands of times.

If you are planning to buy a digital camera, however, keep the following points in mind while shopping.

Size, shape, and feel. Some models fit in a coat pocket, making them travel friendly. Others are bulky and heavy. A camera should contour well to the shape of your hands. The buttons should be easy to locate, and the placement of the liquid-crystal display (LCD) shouldn't leave you wiping off nose and finger prints every time you frame and snap a picture.

Image resolution. The higher resolution a camera

and times on images. Most models have video-out sockets to display images on a television, VCR, or projector, and some even connect directly to photo or inkjet printers.

Memory & Transfer

The way in which digital cameras save and transfer images to a computer has also improved. Some models still use internal memory to store images, but most now use the preferable method of inserting removable memory cards directly into a camera's card slot. If you have a digital camera that uses internal memory, you must react whenever the memory is full by transferring or deleting images before you can take additional photos. Conversely, if you have a digital camera that uses memory cards, you can simply interchange a full memory card with another card, just like a roll of film.

Removable memory cards are available in a few different forms, including 3.5-inch diskettes, PC Cards, and minicards. If you're interested in the minicard form, the two most popular formats are Compact Flash and SmartMedia. CompactFlash cards exceed 96 megabytes (MB) in memory, while SmartMedia cards are smaller and top out at 16MB.

Although most models allow users to transfer images by connecting a serial cable to the camera and PC, several new models use infrared and Universal Serial Bus (USB) connections for faster transfer rates. Users can also transfer images by inserting memory cards into PC Card adapters (about \$10) or, for SmartMedia cards, users can easily transfer images by using a FlashPath adapter (about \$50) that inserts into a diskette drive. For many, the fastest and easiest transfer method involves using a memory card reader

(about \$50), which connects to a PC like an external disk drive (via a serial, parallel, or USB connection). Transferring images is as easy as inserting a memory card into the card reader—just like a diskette. Beware of compatibility, however, because some card readers support both CompactFlash and SmartMedia cards, while some accept one or the other.

Sony's Mavica digital camera model is one of the hottest selling camera lines because of the standard 3.5-inch diskette (also known as floppy disk) it uses to store images and the diskette drive it uses to transfer images to a computer. However, diskettes store fewer images than memory cards and they also sacrifice some image quality. But for now, users seem to be willing to live with that sacrifice.

"The Mavica camera line has been very popular because of the simplicity it provides with the floppy disk media,"

has, the better the images should be. If you're planning to output 3 x 5 or 5 x 7 prints, you'll need a camera with a resolution of at least 1.2- to 1.5-million pixels. Higher resolutions do mean higher prices, and of course, require more memory to store images.

Viewfinders and batteries. Many models don't have an optical viewfinder to frame photos, thereby forcing you to use the LCD, which drains battery power quickly. Look for a camera that uses rechargeable lithium-ion (Li-Ion) or nickel-metal hydride (NiMH) batteries. Also, using an A/C adapter will help save battery power when transferring images to the computer.

Flash features. Every model should have a built-in unit,

but some don't. Look for digital cameras that have forced, off, automatic, and red-eye reduction settings.

Ease of operation. Unlike film cameras, digital models need several seconds to capture an image. They also

get a camera with a burst mode or continuous shooting function. These features let you take several pictures at once.

Interpolation vs. resolution. Some models boast high resolutions, but only achieve that status by using interpolation software to create or copy pixels and paste them among existing pixels. Interpolation is not a true resolution.

Uncompressed and compressed images.

Images are compressed in order to store multiple images in memory. Unfortunately, this sacrifices some image data in the process. Some models have a CCD Raw mode to store uncompressed images. This mode provides better photos, but only a few can be stored at once.

Optical vs. digital zoom.

Optical zoom is better because it provides you with a wide angle to telephoto focal range. Digital zoom, on the other hand, requires that the camera's embedded software only take a section of an image and magnify it to full size.

Level of expertise. By comparison, entry-level digital cameras are more difficult to use than point-and-shoot film cameras. Stick with a digital model that fits your level of expertise, and you'll be less frustrated. If you're not an advanced photographer, don't buy an advanced model.

Stay with trusted manufacturers. Canon, Eastman Kodak, Epson, Minolta, Nikon, and Olympus are leaders in both film and digital camera markets and will be around for years to come. ■

What is the most you are willing to pay for a Digital Camera?
 (This reference will help you quickly compare digital camera from manufacturers)
 Maximum Price \$ if less than \$1000

Now, I need to understand if you have any absolute requirements
 (Do not check any box unless it is absolutely necessary)

Weight (lbs.)	Resolution (Pixels)	Storage Size (MB)
<input type="checkbox"/> No maximum	<input type="checkbox"/> No maximum	<input type="checkbox"/> No maximum
<input type="checkbox"/> 2	<input type="checkbox"/> 400,000	<input type="checkbox"/> 1
<input type="checkbox"/> 3	<input type="checkbox"/> 640,000	<input type="checkbox"/> 2
<input type="checkbox"/> 4	<input type="checkbox"/> 1,000,000	<input type="checkbox"/> 4
<input type="checkbox"/> 5	<input type="checkbox"/> 1,600,000	<input type="checkbox"/> 8

How do you feel about these features?
 (If you check "Not Important" or "Not Necessary," please "X" checked)

The Active Buyer's Guide site is an excellent resource for determining which digital camera model is the best choice for you.

need a "recovery" time of five to 30 seconds to convert analog data to a digital image, compress it, and store it in memory. If you plan to take action photos,

says Jim Calverley, a Sony digital imaging representative. "It's a universal and cross-platform media. Users don't have to hook up wires or adapters to transfer pictures to the computer. You just put in the diskette and instantly see images."

Despite predictions that the diskette is on its way out, Calverley expects the Mavica line to continue to excel. Users want a camera that performs at a high level but is easy to operate, he says. "We expect it to continue to be very popular among new users. People in general want ease of use. They want high technology, but they want it to be easy and accessible."

The user-friendly diskette storage and transfer method of the Sony MVC-FD91 helps make the Sony Mavica digital camera line one of the most popular among consumers.



Pros & Cons

With so many superlatives for digital cameras, it would seem that film-based cameras are doomed. But film traditionalists don't need to panic just yet. Digital cameras—especially entry-level models—have many more improvements to make before image quality matches that of their film brethren at a price consumers are willing to pay. In addition, producing digital prints isn't cheap. Users must consider extra costs, such as owning an inkjet printer, replacing ink cartridges, and buying glossy or photo paper.

For these reasons and more, a large number of consumers have returned or exchanged digital cameras. According to InfoTrend's poll, 13% out of 500 owners surveyed have already returned a model at least once, citing poor image quality as one reason. Other reasons include camera malfunctions, software problems, and the camera "not being worth the money." In short, until image quality and prices are acceptable, sales will probably lag behind film-based cameras. But the day of getting superior image quality from digital cameras appears to be on the horizon.

Less than two years ago, digital cameras priced between \$1,000 and \$2,000 couldn't match the image quality of

the cheapest film model. Now that manufacturers have closed this gap, and with the recent introduction of 2-megapixel cameras, companies such as Nikon, Olympus, and Epson have almost evened out the competition.

Megapixel refers to a camera's ability to capture an image with a resolution of at least 1 million pixels. A 2-megapixel model typically has a 1600 x 1200 pixel resolution. Resolution refers to an image's sharpness, clarity, and the number of pixels (or single dots) it contains. The amount of bits per pixel determines how many colors display. Most entry-level and 2-megapixel models produce 24-bit images, or images with more than 16 million colors. Generally, the higher the resolution an image has, the better it should be.

"With a 2-megapixel digicam, such as my Nikon [Coolpix] 950, I can get a film-quality 5 x 7 and a credible 8 x 10 [size of photo prints]," says MacNeill of *Digital Camera Magazine*.

Two-megapixel cameras cost between \$800 and \$1,500. A good megapixel model that can match the quality of film with its 3 x 5 and 5 x 7 prints, costs between \$500 and \$1,000. And, although digital cameras for less than \$500 can produce prints, their maximum resolutions can't produce prints that even approach the quality of film.

Much of the added cost relates to the CCD, which is expensive and difficult to construct. CMOS sensors are cheaper and easier to make, but so far they can't match a CCD's image

quality. Both MacNeill and Bouton believe the disparity between digital and film prices will change in the next two to five years. Producing a digital print now costs more than producing a film print, MacNeill says, but prices will even out as the market expands. And realistically, Bouton says that comparing the costs of printing digital and film images probably isn't fair. It is true that a user needs access to an inkjet printer to output digital prints, but users can use the same printer for tasks other than just printing photos. In addition, a user can pick and choose exactly which digital images to print. With film prints, users must develop an entire roll of film to get just one print.

"When all the ancillary costs of film are considered, and again depending on the final use of that film, I don't think the difference is great," Bouton says. "The only context in which digital cameras are much more expensive is if the usage is minimal and limited to printing the occasional picture. Then, it becomes a luxury."

And film cameras aren't likely to fade into the sunset yet. The image quality of digital cameras and the fact that owning a digital camera is still primarily contingent upon owning a computer, are two reasons why film cameras are still popular. But, as consumers become more knowledgeable about the technology and its practical uses, the popularity of digital cameras will continue to soar.

"Almost everyone has a camera, and eventually they will migrate to digital. Film won't go away, just as paper hasn't disappeared because of personal computer displays. Nor have print magazines died as a result of the Web," MacNeill says. "As computer-savvy young people become consumers, they will naturally buy digicams. Experienced film photography buffs are finding that digicams bring new life to their hobby—a hobby that has grown weedy and stale from lack of innovation. Digital cameras are the future of photography." ■

by Blaine Flammig

Photo Fixer-Uppers

Learn The Fundamentals Of Improving Your Images With Leading Photoediting Software

WHETHER YOU'VE JUST BOUGHT a scanner or a digital camera or you're simply interested in improving your photos, you should know about photoediting software. With photoediting packages, one of which probably came bundled with your scanner or digital camera, you can turn disappointing photos into masterpieces and transform snapshots into images of places you've never been. Thanks to these tools, you never again have to cringe at a photo's dingy background or wait for the parking lot to empty out before taking that all-important brochure photo of the corporate headquarters. It takes just a few surprisingly simple

steps to brighten a photo's colors or cut the '79 Vega out of the front parking stall.

Before you attempt to improve your photos, you should understand the terminology and possibilities of photoediting software. This photoediting primer will help you master the basic vocabulary of these packages and pick the right package with summaries of the most popular software.

What's Possible

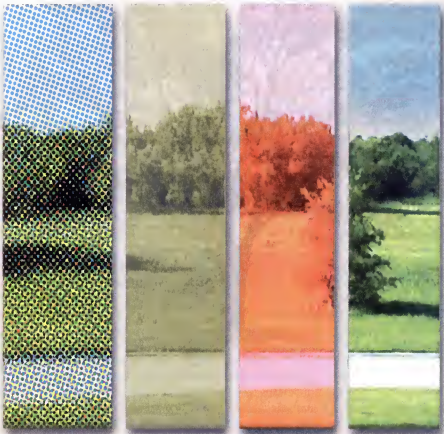
The possibilities for altering images with photoediting software are limited only by your imagination and your

skills with a program's tools. Here's a starter list of tools and their uses:

Cropping. Just because an image starts out rectangular doesn't mean it should stay that way. Most images can be improved by cropping them to remove unwanted detail at the edges. If you're preparing photos for the Web, cropping is one of the quickest ways to decrease image file size, which speeds up page loading. Crop images by using the selection tools to select the portion you want to keep and then discard or crop the rest.

Selection tools. You'll find your image editing software includes a range of selection tools for making selections from an image. A selection is part of the image that you choose for some kind of alteration; it's usually surrounded by a dotted line, sometimes called "marching ants." There will generally be a rectangular and oval tool for making regular-shaped selections as well as a magic wand or color wand tool for selecting parts of an image based on its color. The wand tool will have an adjustable tolerance setting that lets you select a range of colors around the currently selected color. You increase the tolerance to select more color and decrease it to select less. Freehand selection tools let you trace irregular shapes around an image.

Most programs let you create a complex selection in stages. For example, you can select a rectangle shape and then switch to the magic wand. By holding down some combination of the CTRL, SHIFT, or ALT keys you can add or subtract areas from the current selection. Many programs let you save a selection to a path in the image file or as a separate file to disk so you can use it repeatedly without having to create it each time. This is useful if you have created a complex selection and want to try color corrections or filters on that selection. If you save the selection before you begin and later want to revert to the original image you can open the original file and load the selection from disk without having to re-create it.



Improving image quality. Some images benefit from simple adjustments to brightness (making them lighter or darker) and contrast to increase or decrease the image's range of light. You can adjust a light or dark image using the Saturation and Lightness controls if your software allows this correction. If a correction to the entire image is inappropriate use the selection tools to select part of the image and adjust this part only. We adjusted the photo of the fisherman to the right in two parts. First we lightened the sky and increased its saturation, then we adjusted the fisherman, fish, and water using smaller settings.

Adjusting the colors. For an image with too much or too little of a color you can use the color adjustment options to add or reduce the amount of a particular color. Most programs require you to adjust colors using sliders. Some, such as Adobe Photoshop and PhotoDeluxe, include a Variations option where you select your choice of adjusted images from a variety of color-corrected images. If you select a part of the image, such as the shirt of someone in a photo, you can use the Hue adjustment to change the hue of only the selected part.

Deformation tools. Deformation tools let you select the image or part of it and alter its dimensions. You can reduce or increase its size and skew it or rotate it to get a different result. One handy use of the selection tools is to select the shape of an object, deform the shape using the deformation tools, and then fill the shape with a gradient fill to create a realistic shadow. In the photo of the car and clamp we used the deformation tools to reduce the size of the car and rotate it slightly so it would fit inside the clamp.

Clone. The clone tools are handy for covering up unwanted areas of an image. You might, for example, use the clone tool to remove a swimmer from a poolside photo by "painting" over her with a copy of the pool water.

When you use the clone tool you'll select a "brush" size to use and then typically right-click to select the area of the image to copy from and then paint that area over another area of the image. PhotoDeluxe uses an on-screen marker to show the area you are cloning and the area you can drag into position.



This dark image was brightened by altering the Saturation and Lightness, which resulted in the sky and ocean appearing "bluer" and the fisherman having a ruddier complexion.



In this composite image, we removed the car from its background and added it to another image using layers so it could be positioned inside the clamp.

Filters. Most photoediting software includes a range of filters that operate on the image or a selection to transform it somehow. Some filters change the image so it resembles an impressionist painting, while others add noise (extra pixels useful for blending, evening out imperfections, or providing a grainy look) to the image, soften it, or turn it into an embossed image or a mosaic pattern. The filters with the most practical use are probably the Blur filters (or the Gaussian Blur filter) and the

Sharpen filter. Successively using a blur filter and then a sharpen one can improve the quality of an image by smoothing out imperfections. You can blur the edges of a photo to significantly reduce the file size without compromising the physical size of the image or the clarity of its focal point. Using the Noise filter to add grainy textures to images helps transform them into antique-looking images.

Feathering and anti-aliasing. These tools smooth the hard edges of a selection so that you see a smooth edge instead of a jagged one. They do this by adding colored pixels to even out the edge or by blurring the edges of a selection. While you lose some detail you'll generally find that choosing one of these options when you're copying and pasting parts of an image will give you better results. In the photo of the jogger on the next page, we cut the woman from her background and feathered the selection before adding it to the beach background to give a softer edge to the selection.

Layers. Most photoediting software lets you create layers within an image. This is handy for positioning elements in relation to other elements. In the photo of the car and clamp on the left we cut the car into two pieces and pasted each into its own layer in the image, with the clamp itself being a third layer. We then organized the layers so the front of the car was in a layer behind the layer containing the clamp and the layer with the back of the car was brought forward so it would appear in front of the clamp.

Masks. Masks are selection tools that let you isolate parts of an image to work on separately from other areas of the image. In Photoshop for example, you can create layer masks and use them to apply color correction to parts of an image. The benefit of this is that nothing is permanently altered until you select to merge the mask with the layer. As with layers you can save masks with your image.

Native file formats. Most photoediting software has its own native file format you must use to save your file if you want to maintain the layers and masks that you add. If, for example, you save a PaintShop Pro image with a number of layers in its native format (as a .PSP file), the layers will be there when you open the file again. If you save the same file as a bit-map file (.BMP) it will be flattened permanently into one layer as it is saved.

For a step-by-step example of what's possible with photoediting software, visit this article on our Web site at <http://www.smartcomputing.com>. Look for the August issue link on the left side of the home page, then select this article from the table of contents. You'll see each step of the process as we change a photo's background.

Software

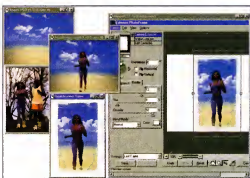
Most popular photoediting software comes from the leading graphics software companies, Corel and Adobe. Each has a number of products ranging from simple packages suitable for home and business use to more complex programs that have features and price tags suitable for graphics professionals. The following list highlights some of the programs you'll find on the market or perhaps already on your computer:

Microsoft Photo Editor 3.0. This program is included with other Microsoft software and is a rudimentary photo editor. It includes some effects you can apply to your image, and it can rotate images and alter them to grayscale. Its lack of selection tools other than a simple rectangular tool makes it an extremely limited piece of software.

Corel Photo House 3. Photo House 3 is one of the components in Corel's Print House 4. This program is less powerful than Jasc's PaintShop Pro and Adobe's PhotoDeluxe, but it includes a number of neat effects and a good range of sample images with a handy interface for viewing the images.

Because it lets you select options from a list along the left of the screen, it's a good choice for a beginner doing basic image editing. For more detailed work, such as creating the composite images shown in this article, it will be cumbersome to the point of frustration.

Corel Photo-Paint 8. This professional graphics package is a powerful



PhotoDeluxe's built-in frame options add a finishing touch to this composite image, which we created by cutting a person from one image, feathering the selection, and placing it into another image.

alternative to Photoshop. It has some unusual terminology, such as using "mask" where other programs talk about "selections." However, it has powerful visual color and tonal correction tools, its tools are easy to use and set, and it has plenty of help available. The software package includes a book with step-by-step exercises using supplied images. The manual includes plenty of color images to illustrate functions, and there are heaps of sample images to practice with. If you've used other Corel programs such as CorelDraw the interface will be somewhat familiar.

Adobe PhotoDeluxe Home edition 3. Beginners can operate this program from a simple pictorial menu, or more advanced users can use a series of Advanced Menus. It supports layers and filters but not masks. Some of its tools such as the Color Wand are cumbersome to use (setting the tolerance requires you to access the program preferences), but it's a robust program that comes with a good range of sample images to practice with.

Adobe Photoshop 5.0. This is the quintessential image editing program with a price tag to match. As the program against which all others are measured, it's a great piece of software with heaps of functions and some neat filters. An added benefit is the abundance of good books on the market that will teach you how to use this

software for specific uses such as collages, image editing, Web graphics, etc. There's a ready supply of third-party filters for it, too.

Jasc PaintShop Pro 5. This popular shareware graphics package supports layers and masks and is compatible with Photoshop filters. It has a good range of selection tools and color correction tools, it's more powerful than PhotoDeluxe in many aspects (masks and multiple undo), and its tools are easier to adjust. If you have no other image editing software you won't go wrong with this package at this price, making it a great choice for anyone eager to find out how photoediting can improve their image. ■

by Helen Bradley

For More Information:

Jasc Software

PaintShop Pro 5, \$99
(800) 622-2793
(612) 930-9800
<http://www.jasc.com>

Corel

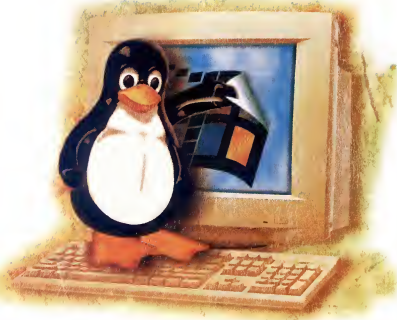
Photo House 3 (part of Corel Print House Magic Classic Edition \$39.95, Wizard of Oz edition \$49, and Premium Edition \$49.95)
Photo-Paint 8, \$495 (upgrade: \$149)
(800) 772-6735
<http://www.corel.com>

Adobe

Photoshop 5, \$995
PhotoDeluxe Home edition 3, \$49
(800) 833-6687
(408) 536-6000
<http://www.adobe.com>

Life With Linux

Facts On The Operating System Standing Up To Windows



OVER THE LAST YEAR, we have watched several operating systems (OSes) that are available as alternatives to Microsoft's wildly popular Windows family struggle to carve out their niche in the OS market. Even though these OSes are interesting and functional, none of them seemed like much of a threat to the dominance of Microsoft's Windows.

This is largely due to the fact that although each OS we looked at had several million users and a couple had software developers creating applications for them, computer makers such as Dell, Gateway, and Compaq were not distributing them. (The one exception being Apple, distributing its MacOS with its Macintosh computers.) Distribution through the retail channel and to corporate buyers is, after all, a huge contributor to Windows' dominance of the OS market. But one Windows competitor has recently begun to clear this hurdle: Linux.

Linux

For a couple of years, Linux (pronounced LINN-uks) has gained support among software companies such as Netscape and Corel. Oracle and Computer Associates, other industry giants, are also lending support by creating Linux-compatible versions of their software. The estimated number of Linux users worldwide today ranges from 10 to 20 million, depending on whom you ask. But perhaps the most dramatic evidence that Linux is coming of age was the announcement in early 1999 that IBM and Dell would offer Red Hat Linux (pre-installed at the request of purchasers) in their server, workstation, and business desktop models. Is this the tip of an iceberg lurking in the path of software titanic Microsoft? It's too early to say for certain, but Linux is an interesting OS with an interesting story, regardless of the outcome.

From UNIX To Linux

UNIX. One thing that makes Linux so intriguing is its origin as a school project. The story goes something like this: In 1969, an AT&T programmer, Ken Thompson, developed the UNIX OS. UNIX was a text-based OS (with an interface similar to that of MS-DOS) based on the computer programming language C. It proved very reliable and very powerful, giving multiple users access to true multi-tasking (a computer's ability to do more than one thing at a time). It quickly became one of the most widely used OSes among mission-critical systems such as network servers and high-powered workstations.

Minix. Eighteen years later, in 1987, a professor of computer science, Andrew Tanenbaum, created Minix, a clone of UNIX, for use in his classes. Although Minix was similar to UNIX in many ways, Tanenbaum wrote it completely from scratch. He also authored a text book on designing OSes (*Operating Systems: Design and Implementation*, 2nd ed. [1997]) to go with it. Educational publisher Prentice-Hall published the book and owns the copyright to Minix as well, but it allows users to download the OS and use it for free for educational purposes.

Linux. Fast forward to about eight years ago. As a computer science student at the University of Helsinki, Finland, Linus Torvalds set out to develop the kernel (the basis of an operating system or program that contains high-level instructions for interacting with a computer's memory, hardware, and other resources) of an OS based on variations of code found in Minix as a research project. He wanted to create an OS with the power, stability, and flexibility of UNIX, but without the several hundred dollar price tag. Thus was born Linux, which is represented by Tux the penguin in salute to a penguin that bit Torvalds. Torvalds offered his creation to the world free of charge and, as time went by, independent software developers, such as the Free Software

Foundation, added applications and utilities to Linux. While in its infancy, Linux lacked some of the completeness of UNIX, but developers had the ability to add functionality to the OS because they could modify its source code (more on this a bit later).

Today, you can obtain Linux over the Internet via a free download, or you can purchase it through retail channels thanks to companies such as Red Hat Software (which recently released version 6.0 of its Linux product), Caldera, and others that bundle the Linux kernel with various applications/utilities and package them on CD-ROM along with documentation.

Open Source Code, Halloween & Other Mysteries

You may wonder why anyone would pay for software they can get for free. There are several compelling arguments for purchasing a retail copy of Linux rather than downloading it. A big one is its size. Although the actual Linux kernel is fairly small, the full package of applications bundled with Linux in the Red Hat Software version, for example, pushes the size of the OS to more than 400 megabytes (MB). As high-speed Internet connections become more common through the proliferation of digital subscriber lines (DSL) and cable modems, programs this size may become more readily downloadable. Given the amount of time it would take most people to download a program of this size, though, it's easy to see why some opt to buy Linux. Add to that the availability of professional documentation and E-mail and telephone technical support, and Linux in a box looks better and better. Red Hat's latest Linux release, version 6.0, retails for about \$80.

The other obvious question when comparing free software to commercially developed software is whether freeware such as Linux compares in quality and functionality to UNIX. While some would

argue that UNIX is more complete out of the box and Linux is a work in progress, Linux advocates see this as a strength. Linux developers have seen to it that Linux can do virtually anything UNIX can do. And because it is free, its power is more readily available to individuals and small businesses that may be unable to implement UNIX or Windows NT on their networks.

Open source. Even more interesting than the different methods of obtaining Linux is the thing that really sets it apart from UNIX, Windows, and others: open source code. Two types of code exist within every computer program written, sold, bought, and used. They are binary code and source code. Binary code is the code the computer understands, a seemingly endless stream of ones and zeros that each indicate yes or no (on or off). Source

code is the language that computer programmers understand, the instructions they put into their programs that tell the computer what to do and how to do it. Whereas the majority of retail software comes with only the binary code, Linux comes with complete source code, allowing people with the technical know-how to change Linux at will to meet their individual needs.

Robert Young, the chair, CEO, and co-founder of Red Hat Software, says, "It's a little bit like buying a car. With Linux, you're buying a car with a hood that you can open. In a proprietary OS, that hood is welded shut."

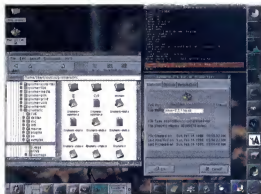
The open source phenomenon brings much more to Linux than the ability users have to create their own powerful applications. It is more accurate to say open source has actually made Linux what it is today. Torvalds himself still oversees a large amount of work on the Linux kernel (which has reached version 2.2.x). He, with some help from other developers, maintains the continuity and standardization that keeps Linux running smoothly. But the vast majority of the interface programs, applications, and other add-ons that make up Linux versions have been programmed by independent software developers.

What scares commercial software companies, such as Microsoft, that have to pay their programmers and engineers for their services, is that those who contribute to Linux do so for free. Thousands of Linux devotees spend large chunks of their free time developing, testing, and refining applications and utilities for use with Linux. Then, companies such as Red Hat and Caldera compile these efforts with existing Linux modules to create a complete OS. Torvalds himself doesn't earn a penny for his work on Linux (he has a day job as a software engineer for a Silicon Valley chip company).

Halloween. So how worried is Microsoft about the open source "movement"? In late October of 1998, Linux developer Eric Raymond received what was alleged to



Tux the penguin is the official Linux mascot, but many other versions of Linux, such as Red Hat and Caldera, have their own icons/mascots.



This screen shot of the GNOME interface demonstrates the flexibility the application offers in terms of users being able to configure their desktops to their liking.

be a confidential internal Microsoft memorandum via a leak by an unnamed source. Vinod Valloppillil, a Microsoft software engineer, wrote the memo, which outlined both the perceived threat posed to Microsoft by open source development and possible strategies for dealing with this threat. Raymond, in turn, made the contents of the memo public in his capacity as a proponent of open source software development, dubbing the memo "The Halloween Document."

You can view the annotated version of this memo (with commentary and analysis by Raymond) at <http://www.opensource.org/halloween.html> and Microsoft's official response to the memo at <http://www.microsoft.com/ntserver/nts/news/mwarv/linuxresp.asp>. In the memo, Valloppillil states, "OSS (open source software) poses a direct, short-term revenue and platform threat to Microsoft." He later points out that, "Recent case studies (the Internet) provide very dramatic evidence in customers' eyes that commercial quality can be achieved/exceeded by OSS projects."

Raymond obtained and published a second "Halloween Document" with similar content shortly thereafter. Microsoft confirmed the authenticity of the memos, playing down their importance by stating the documents reflected the views of individuals within the company and were not official company positions. Supporters of Linux and open source software development, however, see the infamous documents as proof of the superiority of open source development over the traditional commercial method and as validation of Linux as a Microsoft competitor.

A further indication of Microsoft's growing concern over Linux came in May of this year. Microsoft reportedly formed a small team of employees assigned to researching and countering Linux's phenomenal growth in the corporate server market.

The Changing Face Of Linux

If you haven't heard much about Linux, then it's probably because

Linux is still mainly a tool used by sophisticated users. Its roots as a UNIX derivative (text-based interface, etc.) have put it a bit over the head of the average user. The fact that it comes with open source code is really only a benefit if you have the technical skill to use it. The majority of Linux users use it on Web and network servers, as it provides a stable environment for hosting Web sites or controlling the flow of data in a network. As such, Linux is more of a Windows NT (WinNT) competitor than a competitor of Windows 95 (Win95) or Windows 98 (Win98).

Independent programmers, however, are hard at work creating new operating environments to make Linux more user-friendly. They are doing this in the hopes of expanding the Linux market to include end users who use computers as solutions to work-related problems, but may not have quite as much technical expertise. Many of these projects (with names such as X-Windows, GNOME, and KDE) have taken the form of graphical user interfaces (GUIs) that bring use of Linux closer to what users are accustomed to with Windows.

"These new interfaces—and the GNOME interface is probably the most popular of them—give you exactly the same mouse-driven, point-and-click user interface to your computer as Windows and the MacOS give you," Young says. He goes on to say non-technical users should make themselves aware of the Linux phenomenon because "If you trust other people to

install computers for you—and most of us do—sooner or later someone's going to plunk a Linux machine in front of you, and you might not even notice."

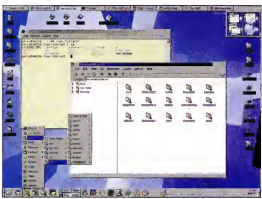
The Movement Gains Momentum

As we mentioned earlier, Linux has begun to make inroads in the areas of third-party software applications and distribution with computers. Corel's WordPerfect 8 is now available in a Linux-compatible edition, Oracle Corp. offers a Linux version of its Oracle8i database software, and Computer Associates recently announced a partnership with Red Hat Software to produce a Linux-supporting version of its Unicenter TNG Framework enterprise management software.

Dell Computer Corp. has become one of the first major computer manufacturers to factory pre-install Red Hat Linux 6.0 on corporate desktop PCs, and computer giant IBM is teaming up with Linux in both the software and hardware arenas. The company has made its ViaVoice speech recognition software available for the Linux OS and has set in motion a partnership with Red Hat to optimize several types of its computer system products for Linux, including Netfinity servers, PC 300 Commercial Desktops, and ThinkPad notebooks. Hewlett-Packard is getting in on the Linux craze as well. It announced earlier this year that it is adapting its popular Kayak line of PC workstations to work smoothly with the Linux OS as part of its Open Source Solutions Operation.

The upshot of all this is that while you probably won't be doing your taxes on a Linux PC at home this year, you might be before too long. And if you aren't, who knows? You may find a Linux computer on your desk at work next week because the people fueling its popularity are the people that run company networks and Web sites around the world. ■

by Chris Trumble



Another popular Linux graphical user interface (GUI) application, KDE (the K Desktop Environment), shows that point-and-click navigation for Linux is alive and well.

SHOP FOR HARDWARE

AND SOFTWARE IN YOUR UNDERWEAR

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Is USB Now Connected With The "In" Crowd?

Universal Serial Bus Makes Its Move Into The Mainstream



IF YOU COULD PEEK at the computer industry's hypothetical "In & Out" list for 1999, USB would most definitely be in, while its predecessors—serial and parallel ports—are on their way out. Despite its unglamorous name (USB or Universal Serial Bus) and uninteresting function, USB does have some promising features (for a computer standard, that is). Apparently manufacturers share this sentiment as well, because the number of USB peripherals has recently mushroomed. In just three months, between December 1998 and February 1999, the number of USB products on the market quadrupled from 60 to 250, and the numbers continue to grow at an impressive rate.

Like other ports, users can use USB to connect a wide variety of peripherals, including modems, printers, scanners, and digital cameras. USB also promises to replace other ports on the computer, including the keyboard, mouse, and game ports. In fact, USB keyboards, mice, and joysticks are already available. According to PC Data, the percentage of USB scanners sold has gone from 0% in June 1998 to more than 40% in March 1999

and the number of USB printers sold has grown from 0% in June 1998 to 25% in March 1999. Currently, however, serial and parallel port peripherals are still the norm, but it's only a matter of time before USB becomes the standard thanks to its speed and ease of use.

For now, manufacturers are shipping PCs with USB ports in addition to the traditional ports so that users can continue to use old peripherals while also trying out new ones. Of course, USB may never truly replace the old ports. After all, expansion cards that use Peripheral Component Intercon-

nect (PCI) expansion slots inside the PC were supposed to replace the slower, less friendly Industry Standard Architecture (ISA) cards when they debuted in 1994, but virtually all desktop PCs still include an ISA slot.

The Power Of USB

If you've purchased a PC within the past year, it probably includes USB ports. Plus, the number of USB peripherals grows almost weekly. So far, the standard has lived up to most of the hype. It's more flexible than the standard serial ports, handles more peripherals, is easier to set up, and offers better speed performance. But in other areas, the USB standard hasn't quite kept its promise. For example, USB supports daisy chaining items (adding more devices by plugging them into the last device in the chain), but most peripheral manufacturers aren't including the required pass-through port (a second USB port) to accommodate such an arrangement. And the USB's speed, while impressive, is already looking a bit miserly compared to other options.

Flexibility in numbers. As we mentioned earlier, USB does a little bit of everything. You name it, and there's probably a USB version of it. Some new monitors use USB so that users can control the monitor settings through fancy, full-featured software control panels instead of using the buttons on the front of the monitor to access a less user-friendly menu. There are even external hard drives and compact disc recorders that use USB ports.

Like serial ports, there are usually only two USB ports on a computer. On laptops, perhaps only one USB port is available. But, unlike serial ports, the number of devices you can connect to a USB port is virtually limitless. OK, there is a limit—127 devices—but, if you need or can afford any more peripherals than that, you can probably afford to splurge on a few more computers, too. The point is, it's easy to run out of serial or parallel ports; however, it's almost impossible to run out of USB ports.

Daisy-chain shortcomings. Although USB was originally designed to be daisy-chain capable, finding USB devices with a pass-through port, to which you can connect another USB device, is almost impossible. Instead, if you want to use more devices than there are USB ports on your PC, you'll need to buy a hub (4-port hubs retail for \$50-\$60 and 7-port hubs cost approximately \$100).

"We envisioned that almost every device would have a pass-through connector on it," explains Dave Murray, who helped write the USB specification when he worked at Compaq. "There's two reasons it's not happening. One is cost, especially on printers and scanners where the manufacturers don't want to add that extra \$2 or \$3 because those products are so competitive in price."

Most of all, he says, pass-through ports can become a technical support liability for companies. "What happens is, you plug your printer into your scanner and the printer doesn't work," he says. "Who do you blame? Is it the

printer's fault or the scanner's fault?" Manufacturers, whose reputations rest on the performance of their products, aren't willing to take the risk of letting another product tarnish their image.

Murray, who now works for Entrega Technologies, which makes add-on USB cards and USB hubs, says that USB hubs are among the easiest to use and require little technical support from the company. But many of the technical support calls Entrega receives concerns bad USB devices that won't work even

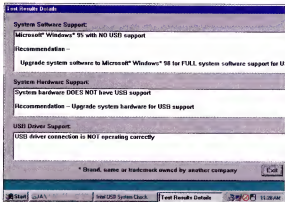
them in or unplug them when the computer is on. USB devices are also auto configurable, meaning when you plug them in, the computer will automatically recognize them and set them up for you. You might have to insert a diskette or disc with the necessary drivers, but installing the drivers and configuring the device to work with your computer will be taken care of for you.

When you unplug a device, the PC senses that it is no longer attached and the peripheral is automatically disabled

in its system settings. When you plug it back in, the PC reloads the drivers and settings without having to ask for the driver diskette or disc again. This makes it especially handy if you have more USB devices than open USB ports. You can unplug a device, plug something else in its place, and then later reattach the other device without having to manually install or remove the drivers each time. So, if you own reliable USB hardware, the usability and ease-of-use of USB ports is much better than that of serial and parallel peripherals and ports.

In addition, conflicts between two parallel port devices are not unusual; some of them just don't know how to share. For example, if both a printer and a scanner need your PC's parallel port, you'll have to hope that the scanner comes with a pass-through port (most do) so that you can have both the scanner and printer hooked up at the same time. However, none of this matters if the two devices cannot get along. And for most consumers, this dilemma is frustrating because they generally won't know the compatibility outcome until they have both devices at home and are trying to install them.

Speed ups and downs. USB is a mixed bag as far as speed goes. At 12 megabits (or 1.5 megabytes) per second, USB is much, much faster than a serial port or a standard parallel port. There are some areas, such as digital photography, where the speed of USB is a godsend. Instead of having to connect cameras or memory card readers to the



Intel's USB System Check can determine whether your PC has both hardware and software support for USB.

when plugged into the "root" port, which is the USB port on the back of the computer. Although this type of problem has nothing to do with Entrega, the company continues to receive technical support calls such as this, simply by virtue of association—exactly what manufacturers are trying to protect themselves from.

Ease of installation, or not. USB devices aren't quite the ease-of-use utopia they promised to be. USB was supposed to solve a lot of the "plug and pray" hassles users have come to fear when installing new hardware. But bad products and manufacturers are hardly unique to USB. Even so, installing USB devices is still usually easier than adding a serial or parallel port peripheral.

With many serial or parallel port devices, installing a peripheral involves shutting down the computer, attaching the cables, connecting a power supply, etc. USB devices, on the other hand, are hot pluggable, meaning you can plug

agonizingly slow (.115 megabits per second [Mbps]) serial ports, pictures transmit via the speedier USB port, saving users precious time.

Some of the other ways that manufacturers are using USB, however, are not such great ideas. For example, some manufacturers have put USB hard drives and compact disc recorders on the market. While these devices offer unequalled ease of installation and remarkable portability, speed is not their strong suit. The Integrated Drive Electronics (IDE) or Small Computer System Interface (SCSI) buses, usually used to connect these drives, have a *minimum* speed of 3.3 megabytes per second (MBps), which is more than twice as fast as USB's top speed.

UltraIDE, which connects hard drives and CD-ROM drives to PCs, has a maximum speed of 33.3MBps. Other flavors of SCSI top out anywhere from 20MBps to 160MBps. With low-bandwidth devices, such as modems, joysticks, and mice, USB provides more speed than those devices will ever need. But with mass storage devices, like hard drives and compact disc recorders, the portability and ease of install aren't enough to make up for the dramatic drop in speed and performance.

Purchasing Points

So will USB peripherals work with your PC? If you have Windows 98 (Win98) and a USB port, you have everything you need. Later versions of Windows 95 (Win95) will support USB to a certain extent, but even if you download the Win95 patches that enable USB, you won't get full USB support. And things get a little trickier if you have to add a USB card to your PC. To find out if your Win95 system will support USB at all, download the USB evaluation utility from http://www.usb.org/shopping_bag.html.

Availability and variations. Most inkjet printers now come with a USB connector, except for those that cost \$100 or less (and from our experience, you wouldn't want one of those anyway). Some of the more expensive

scanners have both parallel and USB ports, but with the least expensive scanners (less than \$200), it's usually an either-or proposition. Many new digital cameras also have either direct camera-to-PC USB attachments or memory card readers that use USB. And developers are constantly creating new ways to take advantage of USB. For example, cable and satellite modems once required an add-in card, but now, USB versions are being developed that will allow users to add a high-speed modem without having to pop the case open to add an Ethernet or modem card.

Cost factors. USB products generally cost just as much, or slightly more, than parallel and serial port products.

For scanners, the difference might be somewhere between \$0-\$30. In addition, USB scanners are almost always cheaper than the SCSI versions, even before the cost of a SCSI expansion card is added.

All in all, USB is a great feature to invest in. And with the exception of mass storage devices, we recommend considering USB for future peripheral purchases. If your PC doesn't have USB, you might look into whether adding it is worth the extra hassle. For those of you who have PCs with built-in USB ports, we think you'll appreciate what USB has to offer. ■

by John Lalande

Adding USB To Your PC

If you don't mind the extra work of upgrading your older PC, adding USB to it is not much more difficult than adding a sound card.

First, make sure your PC can handle USB. You'll need an open PCI expansion slot and a processor robust enough for Win98. Check your computer's users manual for specifications about how many PCI slots your PC has. Your PC should also have at least a 486DX/66 processor or newer, the minimum requirement for Win98 and full USB support. Of course, to truly benefit from the speed of USB, we recommend a Pentium or comparable processor.

If your PC can handle USB, we recommend buying USB cards that come with four ports instead of two. They are a little more expensive than

the 2-port cards (most cost about \$35, 4-port cards are \$50), but they save you from having to buy a hub, then they'll save you at least \$50.

Once you have your USB card, shut down and unplug your PC, then open the case. It is imperative that you consult the manual if you're unsure about how to do this, especially for safety reasons.

After removing the cover, look for the PCI slots. They're are the short, slender white slots at the rear of the computer, right behind the metal expansion slot covers. Select a PCI slot (it really doesn't matter which one), unscrew and remove the cover in front of it, and set aside the screw. Line up the edge connector (the bottom of the card needs to be even with the metallic strips) with the slot. Push the

card firmly into the slot, making sure that it's all the way in. The metal slot cover (with the USB ports) should be flat against the back of the PC case. Use the screw you set aside to fasten the card into place.

Finally, replace the PC cover, reconnect the power cable, and then reboot. Your PC should detect the new hardware and ask for the diskette or CD-ROM containing the necessary drivers. Pop it in, and you're set. And since each USB card is different, you might need to consult its setup guide for more specifics.

Once you've installed and configured the card, the hardest part of installing USB is behind you. From here on out, installing USB peripherals should be as simple as plugging them into the USB port. ■

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Desktop Systems

Sweet Apple, Sweeter Price

In the past seven months, we've watched Apple Computer Inc.'s iMac emerge from a 233 megahertz (MHz) system to a 333MHz powerhouse. Apple hasn't changed the design of the iMac, but the system does include a faster processor, more software titles, a larger hard drive, and a lower price. We also discovered the iMac has a lot of power and plenty of connectivity options. Although one could easily assume the iMac is only for students or die-hard Mac fans, for \$1,199, the iMac would make a great addition to the home, but there are a few drawbacks to this system.

The iMac lacks some standard features you can find on most PCs, such as an integrated 3.5-inch diskette drive. (This means you will have to buy an external diskette drive or transfer files using a network or modem connection.) The iMac also uses the Mac OS 8.5 operating system, so its not compatible with a PC.

The iMac can, however, read PC diskettes (but PCs can't read Mac diskettes). Plus, most of the business and entertainment software titles for PCs are available for Macintosh platforms as well. For about \$50, you can also get an emulator so you can run PC software on your Mac.

One area where the iMac impressed us was in its setup process. It is one of the easiest systems we have ever set up. You simply plug in the power cord, keyboard, and mouse, hook the system to either your phone jack or network, and turn on the power.

Apple designed the iMac with the consumer in mind, which means it's easy to use, yet it can handle most multimedia applications and Internet activities. The system has a 333MHz PowerPC G3 processor, which Apple claims is twice as fast as a 500MHz Pentium III.

iMac

\$1,199

Apple Computer Inc.

(800) 538-9696

(408) 996-1010

<http://www.apple.com>

Although the iMac has a hefty processor, it falls short in memory, with only 32 megabytes (MB) of Synchronous Dynamic RAM (SDRAM). You can expand the memory to 256MB, but even value-priced Intel Celeron systems are shipping with a minimum 64MB of SDRAM to handle intense applications. The system also ships with an average-sized six-gigabyte (GB) hard drive. However, you can attach the system to a network and store all your important data on a server, and there's a built-in 56 kilobits per second (Kbps) modem.

The iMac features a 24X CD-ROM drive, and an accelerated ATI Rage Pro Turbo graphics controller with 6MB of video memory. You can view these programs on the integrated 15-inch display, which has a 13.8-inch viewable image area and a maximum resolution of 1024 x 768. There is no additional port to attach a different monitor on the iMac, so the 15-inch display will have to do.

One notable feature is the built-in speakers with stereo surround sound (SRS) and their two headphone jacks at the front of the unit, which allow two people to listen to a CD or silently watch a program simultaneously. The iMac also offers a "fine-motor-skill" mouse and height-adjustable keyboard.

There are no Peripheral Component Interconnect (PCI) slots free on the iMac, but you will find an extra memory slot to take advantage of the maximum 256MB of RAM the system will support and two free Universal Serial Bus (USB) ports.

To test the iMac, we used all the programs that shipped with the unit and a few intense 3-D graphics programs such as Tomb Raider II and Office 98 Macintosh Edition. The iMac breezed through our tests, delivering commendable 3-D images and loading software in a flash.

With its innovative design and solid performance, the iMac is worth considering for your personal use. This system certainly has a few short-comings, especially if you don't like the lack of a diskette drive or the integrated monitor, but it is a great system for editing your family photos or balancing your family's budget. Either way, the \$1,199 price and the variety of colors you can choose from make the iMac extremely appealing. ■

by Buffy Cranford-Petelle

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Remote Controls

Take Control

Harman Kardon's Take Control remote control is not a computing device, but it involves some really cool technology that works with your PC.



Take Control TC1000

\$349
Harman International
(800) 422-8027
(516) 496-3400
<http://www.harmankardon.com>

The TC1000 is an all-in-one remote control that works with virtually every home electronics device you can control with a remote. With this device, you can give commands to your television, VCR, CD player, Digital Video Disc (DVD) player, and more. This remote even works with components from more than just the top 10 brands. For example, the VCR setup menu alone lists more than 130 brands of VCRs.

This remote offers a very sparse physical button configuration (a scrolling wheel/

selector, a main menu button, volume controls, and mute and backlight buttons) and leaves the majority of device-specific controls to its touch-screen display, which is approximately 2.25 inches wide and 2.75 inches high. The TC1000's liquid-crystal display (LCD) touch screen will take you through the process of adding each device to the unit.

But here is where Harman Kardon and Microsoft really leave the competition behind. Whereas most devices must be completely reprogrammed each time the batteries run out, you can save your device settings to a file on your PC with the included Microsoft software and serial-link cable. When your batteries go dead, simply replace them, connect the TC1000 to your PC, and synchronize all its settings with your saved settings. You can also update the settings saved to your PC each time you add or delete an item from your remote simply by plugging in the PC link cable and clicking Yes when your system asks you if you want to synchronize the saved settings with the device's settings.

The TC1000's advanced functionality, along with its great, backlit LCD touch screen make it an excellent multidevice remote. It does carry a premium price—the suggested retail price is \$349—but if you're serious about home entertainment and you are tired of doing the remote shuffle, then it's worth every penny. ■

by Chris Trumble

Storage

Zip Magic

We have three answers that can't wait for your questions: Iomega's 250-megabyte Small Computer System Interface (SCSI) Zip Drive (\$199.95) is faster than any other Zip we've seen, its diskettes (as inexpensive as \$16.65) hold more than twice the data of the 100 megabyte (MB) versions, and it's backward-compatible with the millions of Zip diskettes in the world.

Through some curious marketing logic, Iomega describes the SCSI Zip 250 as the "Mac" (Macintosh) version, while the parallel port version is the "PC" offering. Rest assured, however, that the Mac Zip 250 will also work on PCs equipped with a standard 25-pin SCSI card, such as Iomega's Zip Zoom SCSI adapter (\$45 estimated street price). This is actually

a worthwhile investment, as the transfer speeds you'll get through a SCSI connection will make a parallel port look like rush-hour traffic downtown. You can even daisy-chain other SCSI peripherals through the Zip 250 or flip the terminate switch on the rear of the ZIP drive if it is the only connected device.

It took only 61 seconds to write a 67MB Adobe Photoshop file to a Zip 250 diskette through a Zip Zoom SCSI adapter. (Transfer times will be longer writing to an old 100MB diskette; and no, you can't reformat these to 250MB.) For contrast, a regular Zip 100 took nearly seven minutes to squeeze the

same file through a parallel port, while a Universal Serial Bus (USB) Zip 100 did it in exactly two minutes.

Notebook computer users will appreciate the Zip 250's automatic low-power mode for energy conservation. And PC users with at least a 100 megahertz (MHz) Pentium and 16MB of memory can use the bundled RecordIt application to record up to 20 hours of audio on a single 250MB diskette.

Both the SCSI and parallel versions of the Zip 250 have a one-year limited warranty. But if they live up to the reliability of previous Zip drives, you won't have cause to use it. ■

by Marty Sems

Zip 250MB SCSI Drive

\$199.95
Iomega Corp.
(800) 697-8833
(801) 778-1000
<http://www.iomega.com>



Handhelds

Hitachi Handheld Lacks Punch

Measuring 10 inches wide x 5.5 inches deep x 1.3 inches high and weighing 2 pounds, the Hitachi HPW-200EC tries to stand out as a smaller, lighter, handheld PC. Instead, it stands out for all the wrong reasons.

The first thing we noticed about this handheld was its outdated software. Microsoft's Windows CE 2.0 doesn't include the pocket applications the newer Windows CE Professional Edition does. Hitachi does, however, offer a \$100 upgrade to the Professional

HPW-200EC

\$699
Hitachi Ltd.
(800) 448-2244
(650) 589-8300
<http://www.hitachi.com>



Edition. Still, most handheld manufacturers are already shipping the latest operating system on their devices.

The unit comes with a 100 megahertz (MHz) SH3 processor and 16 megabytes (MB) of RAM. The hardware provides an acceptable performance, although it does fall short of other closely priced units. The 33.6 kilobits per second (Kbps) internal modem was slow, too. It brought the rest of the system to a near standstill when we used it.

modem use). Actual battery life may vary.

The bundled software did include some nice extras, including Biz Calc, a business calculator, and Pocket Finance, which will help you track expenses.

Hitachi recently dropped the price for this unit to \$699, making it one of the cheapest handheld devices on the market, but not by much. For the \$100 you would spend to upgrade this unit to Windows CE Professional, you could buy a similar-sized handheld that features the new operating system and faster performance. ■

by Chad Denton

CD-RW Drives

Warning: Slow Driver

Memorex is known more for storage media, rather than storage devices. But it is moving into the CD-rewritable (CD-RW) market with several new products, including its 4224 CD-RW 4X24 drive.

The unit we reviewed supports the Windows 95, 98, and NT 4.0 operating systems and had an Advanced Technology Attachment Packet Interface (ATAPI), which is an extension to the Enhanced IDE (EIDE) interface that supports CD-ROM and tape drives that were left out of the original EIDE and IDE standards. The unit included Newtech Infosystem's (NTI) CD-Maker software, which was pretty easy to use.



CD-RW 4224

\$269.99
Memorex
(800) 636-8352
<http://www.memorex.com/core.html>

The installation manual, however, needed to be more thorough, and it could have used a few illustrations.

This CD-RW drive can read an array of optical drive formats, including the usual audio CD, CD-ROM, CD-rewritable (CD-R), and CD-RW. Basically, if it comes on a CD, then this drive should be able to read it. The Memorex 4224 also has a two-megabyte (MB) buffer.

We installed the Memorex 4224 CD-RW on a 300 megahertz (MHz) IBM Pentium II with 64MB of RAM, running Windows 98. Installation was smooth—we didn't have any problems.

We measured the drive's speed and performance potential in our first tests. We clocked the 4224's average data-transfer rate at 2681 kilobytes per second (KBps), which equals a drive rating of 15.7X. This is a pretty respectable speed for a 24X CD-RW drive.

Next, we measured the drive's random-access and full-stroke-access times. The random-access time is the average amount of time the CD-RW drive needs to find a piece of data. The full-stroke-access time refers to how long it takes to move from the innermost to the outermost

track on a CD-RW drive. The random-access time was 139 milliseconds (ms), and the full stroke access time was 231ms. These are also good, solid numbers.

Finally, we timed how quickly the drive could record 23MB of data. We measured the recording time at one minute, 55 seconds, which was kind of slow.

This drive is OK, but it wasn't great. The general performance was good, but the weak manual and slower recording time left us looking for a different drive. ■

by Michael Sweet

Inkjet Printers

Printing Problems

The BJC-2000 has some intriguing features and marks a definite improvement on previous Canon inkjet printers. Unfortunately, it still falls short of the standard set by other printers in its price range.

The BJC-2000 did perform well in terms of ease of use and features. Setting up the printer was a cinch, thanks to a comprehensive manual and a well-done installation program. The print drivers were easy to use and made using and maintaining the printer straightforward.

The printer also has an intriguing add-on option: You can replace the ink cartridge with a scanner cartridge, transforming the printer to a scanner. The cartridge was not included, so we didn't have a chance to test it, but even if the cartridge lives up to its promise (24-bit, 360 x360 dots per inch [dpi] scanning), it's not likely worth the extra \$69 (estimated street price). The cartridge's resolution wouldn't be good enough to do justice to photos, and it's not much cheaper than buying a flatbed scanner. Sub-\$100 flatbed scanners, for comparison, average 600 x 1200 dpi and have a 36-bit resolution.

The printer was speed—its times were among the best in three of our four tests—but that speed apparently came at the expense of print quality. Text was fuzzy, even at large point sizes. The graphs we



printed looked good, but the text below them was marred by banding (white horizontal lines running through the text). The photo we printed actually looked better using the standard color cartridge

than it did when we used the special photo ink cartridge. The photo cartridge offered slightly better resolution than the color cartridge, but the colors were muted and the photo was darker than our original.

BJC-2000

\$129 (after \$20 rebate)
Canon Computer Systems Inc.
(800) 423-236
(714) 438-3000
<http://www.ccsi.canon.com>

Thanks to its speed, the BJC-2000 isn't the worst printer in its price range, but considering the poor print quality, it's far from the best. ■

by John Lalande

Voice Recorders

A Collective Voice

Inconspicuous with its size and weight, the V90 Digital Voice Recorder from Olympus looks like an oversized key chain. However, don't let its diminutive size fool you. This small wonder has an impressive arsenal of organizational tools to help bring order to your life.

With a built-in microphone, speaker, and flash memory, the V90 digitally records more than 90 minutes of notes, reminders, and contact information in a Long Play (LP) mode or 33 minutes in a higher-quality Slow Play (SP) mode. It stores recordings in three folders. The A and B folders are for general-type messages, while the S folder handles more sophisticated scheduling tasks. You can set a recording in the S folder to sound an alarm at a certain time. Then, you can press the Playback button to plays the pre-recorded message.

Operating on one AAA alkaline battery (for about 10 hours recording time), the V90's Voice Control Voice Actuator lets users record without constantly pressing the Record and Stop buttons. With the Microphone Sensitivity Selector on High, clarity was exceptional. In fact, the V90 picked up ambient sounds with amazing clarity. Considering its size, the V90's speaker quality was equally impressive, with little static, interference, or distortion. A 2.5 millimeter (mm) built-in carjack for headphones made playback even clearer, while adding a touch of privacy.

Maneuvering the V90's functions takes time. The well-illustrated users manual and tiny liquid-crystal display (LCD) made matters considerably easier. The LCD shows the folder in use, message number, number of messages recorded, battery power remaining, current time, recording and remaining message times, alarm activation, and recording mode. The Folder/Menu and Erase buttons made recording, moving messages from folder to folder, and deleting messages as easy.

Weighing just 1.6 ounces, the V90 is surprisingly solid and durable. While tiny, the V90 has enough oomph to help organize your busiest days affordably. ■

by Blaine Flaming

V90 Digital Voice Recorder

\$99
Olympus America
(800) 347-4027
(516) 844-5000
<http://www.olympus.com>



Laser Printers

Common Problems Often Have Simple Solutions

LASER PRINTERS OFFER THE BEST combination of speed, print quality, and reliability on the market. But they can't live up to their potential if you don't properly maintain them. This article will help you prevent and locate problems and maybe even avoid a trip to the service center.

Before we get started, let's take a quick look at how laser printers work. The laser is a beam of energy that the printer shoots at its optical photoconductor (OPC) drum, which is a magnetized spinning cylinder used to transfer images to the paper. The laser blinks on and off as it traverses the drum, causing each point it hits to lose its magnetic charge. All together, these parts will be the blank spaces on the printed page.

The rest of the drum attracts particles of toner (a powdery form of ink). This toner is then rolled on to the paper as it moves through the printer and then is permanently baked on by a hot fuser roller. The whole process is very fast and results in crisp text and graphic images. As with any complex piece of equipment, a laser printer will sometimes need some maintenance.

Troubleshooting a laser printer doesn't have to be difficult. Many problems are solved simply by resetting

it and rebooting the computer the printer is connected to or by looking up error codes in the users manual. On the computer side, Windows 98 (Win98) offers decent help (click Start, Help, Troubleshooting, Windows 98 Troubleshooters, and Print), as do Windows 95 and Windows NT 4.0 (select Start, Help, Troubleshooting, and If You Have Trouble Printing).

If you can isolate your printer's problem, you won't waste time on other remedies. For example, if you can print from one application but not another, the error is most likely in the unresponsive program's print setup (see the Drivers & Software Problems section).

(NOTE: The instructions we detail below will work for many printers, but you should always check with your printer's documentation before you try to fix any problems. If those instructions differ from ours, follow the manual.)

Finally, if your printer is under warranty, check the regulations to ensure you don't break any rules.

Cleaning

Keeping your laser printer clean is a sensible step that is too easy to ignore. The quick-and-easy way to avoid gunk-related problems is to drop a dust cover or towel over the printer when it's not in use (don't cover a printer while it's running because excessive heat can damage its electronic components.) You'll also want to keep pets, smoke, unsupervised children, food, and liquids away from your printer.

If you do need to clean your printer, first leaf through its users manual. It should tell you which parts need to be cleaned and how often (usually every three to six months). It will also point out the parts of the printer you shouldn't touch. In addition, if any special tools or brushes came with the printer, the manual should explain how to use them. Don't be surprised if the documentation recommends having a professional clean the printer for you.

Printer-cleaning kits and miniature vacuums can be useful, but a clean, lint-free cloth will be your main tool.



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Shut down the printer, unplug it, and let it cool. Wipe down all the outside surfaces first, including the paper trays. Now, open its access panels and carefully wipe down the areas that are OK to clean. Be sure to clean its cooling fan and grill, if it has one.

Finally, if the printer's software includes a utility that "cleans" its print mechanism, use it as directed.

No Printing

If you can't print at all, first check the obvious: Is the printer turned on? Is the online light on (which means the printer is ready to receive the next print job)? Is it out of paper? Finally, was the printer working earlier or is this a new installation? Once these common problems are behind you, read on.

Paper problems. Make sure the paper is correctly feeding into your printer. If there is a paper tray, make sure it's properly mounted and not overloaded. Fan the sheets with your thumb to make sure they're not stuck together, and then lay them straight in the tray.

Sometimes paper gets jammed inside the printer. Jams can happen when paper is torn, folded, or inserted incorrectly. Humidity can also cause paper to jam and tear. A printer that frequently jams may need to be professionally cleaned or have certain parts replaced.

To remove a paper jam, turn off the printer, unplug it, and give it time to cool. Open its access panels and carefully remove any paper you find. Reassemble the printer and try printing again. High-quality paper seems to jam less often than cheaper varieties. Spending a little more for better paper may ultimately prevent problems.

Bad connections. Is the printer's parallel or network cable correctly connected on both ends? Double-check to make sure the cable is plugged into the proper port and that it's firmly engaged in the socket. Be sure to use any screws or retaining clips that are meant to hold the cable in place. Try a different cable if you

have one, and route it so it won't be pinched or stepped on later.

Also, many printers can print a test page without being hooked up to a computer. If it prints, the printer itself is probably not at fault. Check your manual for details.

Power problems. If your printer doesn't work, and its lights aren't on, make sure the power cord is plugged in tightly. Toggle the power switch. If there's still no sign of life, try a different power cord from another device. Next, check your home's fuse box or your power strip for a tripped breaker switch, or you may even need to check nearby wall switches that may control the outlet.

Finally, try plugging the printer into a different outlet with an extension cord. If this doesn't work, your printer's internal fuse or power supply may be dead. Even with the printer unplugged, there's danger of electrocution, so be sure to follow the manufacturer's recommendations or seek professional help.

Poor Print Quality

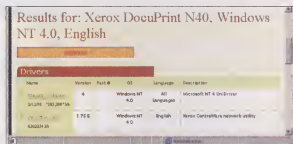
If your printer's output is too light, it may be running low on toner. Smudgy or streaked output suggests a cleaning or better paper is needed; in addition, jumbled pages or formatting errors could indicate a connection problem.

Paper problems. Evaluate the paper you're using. Some kinds of paper curl up or burn when exposed to the intense heat inside a laser printer. Try a higher-quality laser or photocopy paper.

If your printouts are full of broken or incomplete characters, the paper you're printing on may be a little damp. Even if it's not damp enough to feel with your fingertips, the moisture content of the paper may affect how well the dry toner particles stick to the page before the fuser irons them in. Set the paper aside in a very dry room for a week or so. In the meantime, try

some new paper from a different source.

Connection problems. Sometimes a parallel cable that's too long (more than six feet or so) can cause strange print errors. So can a noncompliant cable. For example, modern printers require a parallel cable that is bidirectional and Institute of Electrical and



If the name of the driver you want is hyperlinked, click it to download, then choose a folder to put it in.

Electronic Engineers (IEEE) 1284-compliant; the older kind won't work. And, don't let the data cable lie too closely alongside any power cable. The two cables' electromagnetic fields may interfere with each other, causing errors in the data stream. This interference is called crosstalk.

Memory shortage. A long delay before printing (more than 30 seconds), low resolutions (fewer dots-per-inch [dpi] in the image, indicated by a grainy look), or incomplete graphics may mean your printer or computer doesn't have enough random access memory (RAM) for a task. See the Inner Workings section to learn how to upgrade.

Toner cartridges. If the print is too faint, you're probably low on toner. Turn off your printer and let it cool. Open its access panels and remove the cartridge according to the manufacturer's documentation. Before you replace that expensive toner cartridge, hold it over a trash can and rock it end-to-end. This should redistribute the remaining toner for a little extra life.

When the old cartridge finally needs replacing, buy a high-quality new one and check its expiration date (shelf life is about two years). Install the new

toner cartridge according to its instructions. Be sure to remove any protective tape or wrapping first, and don't do it in your nice clothes. You may have to notify the printer's driver software of the new cartridge.

Other parts. Over time, certain parts, such as the OPC drum and fuser roller will wear out. If you don't feel comfortable replacing these yourself with the instructions provided in your manual, consult a professional. (NOTE: some printers have their OPC integrated into the toner cartridge, assuring it gets replaced as often as the toner.)

Drivers & Software Problems

You can access your printer's settings in Win95, Win98 (Win9x), and Windows NT 4.0 by opening the Start menu, selecting Settings, and Printers. Right-click your printer's icon and select Properties. If you have to announce the new toner cartridge so the driver recognizes it, this may be the place to do so.

Drivers. Printing with a flawed, corrupted, or incorrect driver rarely works. If it does, it often results in garbled or incomplete output. It's always best to start with the drivers that come with a new printer. To install the printer's original software from a CD-ROM or diskette, click Start, Run, and then Browse. Double-click the letter of the CD-ROM or diskette drive, and then double-click the file named Setup or Install. Click OK and follow the on-screen instructions.

Some users try to get by with letting Win9x detect the new device and assign a generic driver to it. Others buy the first laser printer in a new line and get a driver that's not perfected yet. You can improve both scenarios by installing an updated driver, which may contain bug fixes or support for later technological developments.

Most manufacturers post the latest versions of their printer drivers on their Web site. Newer versions will have higher numbers (for example, version 2.2 should be newer than version 2.1). Once you've located the

latest driver for your exact printer model, it's easy to download and install; just follow the site's instructions.

After downloading, installing the new driver is similar in Win9x and Windows NT 4.0. Click Start, Settings, Printers, Add Printer, and then Next. (NOTE: if the driver is an INF file, try right-clicking it and choosing Install. If it's an EXE file, double-click it.) You now have a choice:

- If your printer is used only by your computer, click that option, and then Next. Because we're avoiding Windows' generic drivers, click Have Disk and then Browse. Double-click through the path to the updated driver, select the driver, click OK twice, and then click Next. Select the port the printer uses, and then click Next. Name your printer and click Next. Finally, let the printer print a test page and click Finish.
- If your printer is networked, consult your network administrator or your networking documentation. The new driver must be installed on the print server, and a different driver must be installed for each operating system that accesses it. On the server, click Start, Settings, and then Printers. Right-click the printer's entry and click Properties. Under the General tab, click New Driver and then Have Disk. Browse for the driver's path, and then click OK. (At various points, you may have the chance to set the printer as the default.) Repeat this for each new driver. Client computers accessing a Windows NT 4.0 server should use the updated drivers.

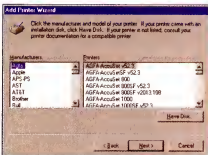
To install a driver in Windows 3.x, select Main, Print Manager, Options, Printer Setup, and then Add. Highlight Install Unlisted or Updated Driver, and then click Install. Browse for the driver by path and click OK. The Setup button, its Options button, and the Advanced button in the Options window all lead to printer configuration areas.

Applications. Make sure your program is set up to print to the right

printer. In most Win9x and Windows NT 4.0 applications, pull down the File menu and select Print. If the destination printer doesn't match your printer model exactly, click on its name to choose another. If your printer isn't offered as a choice, the driver may be corrupt or not installed yet.

Other areas that may be available to you (depending on the program) are Print Setup, Page Setup, or Options. You may be able to locate your trouble in the way the application is configured.

If these suggestions don't resolve the problem, try to print with another application or print a test page if your printer driver allows it. If you can isolate the problem to a single application, and your printer worked before, consider re-installing the program after backing up your personal files and jotting down the settings. You also can call or send an E-mail to the software manufacturer's technical support.



Select Have Disk because you'll be installing a more recent driver than the one Windows offers. Browse for the driver and double-click it.

Print managers. If a print job isn't going anywhere, look at your operating system's print manager. In Win9x or Windows NT 4.0, click Start, Settings, and then Printers. Double-click the printer's icon; under Printer, you can resume a paused job by deselecting Pause Printing. To purge a bad print job, select it and press the DELETE key.

In Windows 3.x, select Main and then Print Manager. If there are no print jobs listed when you open Print Manager, your applications may not

be sending properly. Windows 3.x displays Pause and Resume with their own buttons.

Network communication. While network troubleshooting is beyond this article's scope, you may need to verify that your printer is properly connected with the correct protocol and address and with Print Sharing enabled. Consult the printer's documentation for details.

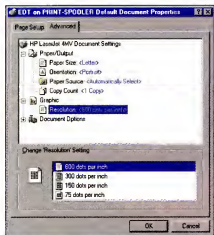
Slow Or Partial Printing

To shorten the delay before the first page emerges, or to print high resolutions and large graphics files, both the printer and computer must have sufficient memory. The way a printer manages its RAM is just as important; we've seen some good quality from a laser printer with 2 megabytes (MB) of RAM. Still, larger jobs will benefit from additional printer memory if the printer is upgradeable.

How much memory your computer needs when printing large jobs depends upon your operating system. If you're using Windows 3.x or Win95 to print graphics, you really should have at least 16MB of RAM. Likewise, Win98 users should have at least 32MB, and Windows NT 4.0 users need 48-64MB. Of course, these operating systems may function on less, but print delays will be excessive.

Your computer also should have adequate hard drive space set aside to store the overflow of information that's too big for its RAM. This section of hard drive space is called virtual memory, and Windows manages it by default. Just make sure there's always at least 50MB free on your hard drive. If you've taken control of your virtual memory settings, select Start, Settings, Control Panel, System, the Performance tab, and Virtual Memory. Set the maximum and minimum to 50MB or more.

Resolution. To kick your printer into overdrive, you can reduce its resolution. For example, dropping from 600dpi to 300dpi will speed things up, but the output will be more grainy.



This printer's resolution settings were found by clicking Start, Settings, Printers, File, Document Defaults, and then Advanced.

In Win9x and Windows NT 4.0, you can usually change your printer's resolution by altering its driver settings (depending on the manufacturer). Click the Start button and select Printers from the Settings menu. Right-click your printer's icon and select Properties. Click one of the tabs at the top of the window to find the resolution controls. Set it to a lower number, if possible, then click OK.

In Windows 3.x, double-click Main, Control Panel, and then Printers. Select the printer's entry, then the Setup button. If the resolution controls are here, make your changes and click Apply, OK, and then Close to continue. If you don't see the resolution settings in the Setup window, try looking in one of the other subordinate dialog boxes (such as Graphics). In addition, disabling software enhancements, such as anti-aliasing (dot matrix printers print text or characters with rough or jagged edges. Anti-aliasing, also known as de-jagging, is a process that smooths the jags.) or 1200dpi emulation also may give speeds a boost.

Inner Workings

Intrepid users may be capable enough to locate a broken part, order a new one, and install it, but remember, a laser printer is an expen-

sive and complex machine. Don't try to fix any mechanical malfunction unless you feel comfortable doing so. You don't want to void the warranty or cause further damage.

If you do decide to try your hand, first get rid of any loose jewelry or ties that might get caught in the printer. Be sure the unit's power switch is off and its cord is unplugged. Because some internal components of a laser printer get extremely hot, use caution when working inside it. Finally, ground yourself while you work by touching some nonelectronic metal object.

Upgrading RAM. Expanding your printer's memory is relatively easy. Check your manual to see if the printer is upgradeable and which type of RAM it requires (printer memory cards are not necessarily interchangeable).

You'll find manufacturer's prices for printer RAM upgrades are curiously high. If an ordinary single in-line memory module (SIMM, the type of memory board that's used in many computer motherboards) is all that is required, you may be able to use generic PC-type RAM and save a bundle. Just be sure you're buying the exact type of memory you need.

Before you buy the new RAM, open the printer's memory compartment cover to see if there are extra memory slots. If there's no room for additional RAM, sometimes you can take out the existing modules and replace them with higher-capacity cards.

Slide the new RAM into the correct slot(s) in the printer and lock it into place with the socket's retaining clips. You may need to enter your printer's new RAM total in its driver settings.

Call The Cavalry

If all else fails, call or send an E-mail to the manufacturer's technical support, or enlist a local service center. You may get a bill if the warranty has expired, but you also may save valuable time and effort. ■

by Marty Sems and Shawn Mummert

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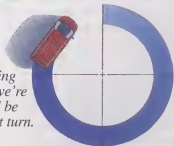


ck will convince you.

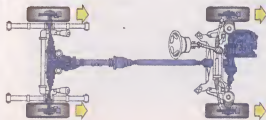


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No Strings Attached

Are Wireless Internet Connections Ready For Prime Time?

IT WON'T BE LONG before you can "plug in" to the Internet or your corporate intranet everywhere you go. You will be able to stay in touch and get your information fix while in an airport terminal or a cab. Wireless connections to the Internet will let you use notebook computers and a new breed of wireless handheld devices to get connected. These wire-free connections will bring a new level of functionality and freedom to on-the-go users.

Wireless technology, however, is like most emerging technologies: what is available and what we desire are still light years apart. Developers will overcome the technological hurdles to perfect wireless Internet access, but it will be some time before all of us can surf the Internet reliably and quickly from anywhere in the country.

How Practical Is It?

Right now, you can plug a cellular-ready PC Card modem into your laptop and use your data-ready cellular phone to dial into the Internet from your favorite location. All it takes is a modem, such as 3Com's Megahertz 56K Cellular Modem PC Card (<http://www.3com.com>), and a data-capable cellular telephone, such as the Motorola MicroTAC 650 (<http://commerce.motorola.com/css/static/mo2000.html>). Simply plug your PC Card modem into your laptop or other handheld device, attach the modem to your cellular phone using a special serial cable, and call your Internet service provider (ISP) using your computer's dialer. This setup works on most any cellular service in the United States, which makes it very convenient and affordable. (Don't try to do any serious Web surfing or gaming using this type of connection; it isn't very fast.)

Dial-up speeds vary, but typically 14.4 kilobits per second (Kbps) is the maximum you will get over a cellular telephone link. Our experience is that 4.8Kbps to 9.6Kbps is more likely. This is fast enough to pick up E-mail messages or copy a word processing document

from your company's intranet. We avoid relying on our cellular link, but if necessary we can download a file.

The problem with using a modem over a cellular phone is that cellular phones aren't designed to carry data. A voice telephone call, whether over a cellular phone or standard wired phone, requires very little bandwidth (the capacity a network of data connection has for carrying data) to maintain an acceptable level of voice quality. If there is a minor break in the communications link, such as a switch from one cell to another, then voice traffic is virtually unaffected. Sure, you may hear some "snaps" and "crackles," but the call continues.

A data connection, on the other hand, is very sensitive to any amount of network latency (the time difference between when a computer issues a request for data from a storage device, and when that device finds and delivers the information). For a data communication to take place reliably, there can be little deviation in the speed of the connection, little noise on the line, or latency between packets (the time between each data packet needs to be pretty consistent). This is why modem makers have added error correction and data compression to their modems in the last 10 years. They knew the limits of available bandwidth and that the chance for noise on the line was great, so they built safeguards to make sure connections stayed together.


Illustration: Jim Medley

Pick up your home telephone and listen carefully. Now, do the same with your cellular phone. For most, the cell phone will be a bit noisier.

This is what a cellular-radio PC modem has to contend with. Throw into this the latency of the network as you switch cells and you can see why data calls over standard cellular systems are difficult.

I Have To Be Connected!

OK, so you just can't stand to be "disconnected" from the Internet/intranet. You have your PC Card modem/Cell phone combination and you can connect to the Internet via your ISP. You quickly notice E-mail moves pretty well, but connecting to a Web site is an agonizingly slow process. This is what you will have to live with if you want to surf the Web using your cell phone.

If you really need to stay connected, then you may decide to create a Virtual Private Network connection into the network at your office. (VPN, a hardware and/or software combination that extends a company's intranet or network across the unsecured and public Internet to allow secure communication. A VPN extends the corporate network, creating an extranet, and eliminates the need for dial-up connections.) Again, you will find short traffic seems to work OK, but other tasks are very slow or impossible to perform. For example, you have no trouble using Microsoft Word to open a document stored in your office, but browsing the network or trying to map a network resource just won't work.

Even though this technology is slower than wired technology, it has one big advantage: It allows users movement. Companies such as Federal Express and Otis Elevator use wireless handheld devices to communicate the delivery status of a package or to dispatch a service technician to a job site. For these companies, they do business by connecting away from the office.

Wireless Networking Defined

This all sounds great, but you may wonder how this technology works. Like other computer-related industries, wireless networking is full of acronyms and terms. We'll see if we can help demystify some of this technical jargon.

The first cellular networks were all analog-based systems. An analog cell system uses a continuous electrical signal to carry the information from a transmitter to a receiver. The next generation of cellular systems (both voice and data) are moving toward an all-digital system. Unlike an analog cellular system, a digital cell transmission is made up of many discrete signals rather than a continuous stream.

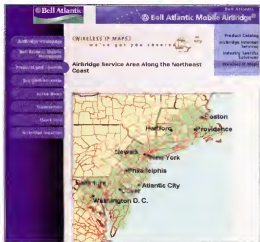
Analog signals also suffer from a number of disadvantages when compared to digital systems. First, an analog signal is very susceptible to noise and interference. Anything that generates an electric field, a vacuum cleaner for instance, can cause static and noise in an analog system. Second, analog systems are limited in the number of calls per channel they can carry. (Digital systems can carry up to 10 times more calls per channel.) Third, digital technology is overtaking analog technology. Most of the research and development for new services today is for digital systems only.

There are two popular protocols in use in wireless digital networking and Internet access: Cellular Digital Packet Data and Code Division Multiple Access. Cellular Digital Packet Data (CDPD) is a data protocol originally developed by Bell Atlantic Mobile and AT&T Wireless. It digitally transfers packets of data, rather than establishing a full-time link as you would with a standard cell phone, and it works with the existing cellular network. It is ideal for sending and receiving Internet data.

Code Division Multiple Access (CDMA) used in a number of wireless

services in addition to wireless data networking, is a spread-spectrum technology. CDMA, developed by Qualcomm, allows more people to use the same spectrum, which means more users and a lower cost. This system works by splitting transmissions into packets and assigning a specific code to each one. As of today, you will only find coverage in major metropolitan areas.

All of the major wireless carriers have not yet accepted CDMA. But more are changing to CDMA or enhancing their existing services with a separate CDMA system. From our perspective, because CDMA is being deployed as a wireless local loop (WLL, wireless telephone to the home) solution, it will become the dominant technology in the next few years. For now, however, choose your service based on geographic reasons and not protocol reasons.



Bell Atlantic Mobile's AirBridge wireless Internet Protocol (IP) network covers a significant area along the Northeast coast of the United States.

Who You Gonna' Call?

Of course, you don't need to limit yourself to PC Card modems and analog cell phones for wireless connections. Depending on your location, you can choose from ARDIS, Ameritech Cellular, Bell Atlantic Mobile, and MetriCom to name a few. Each company offers wireless data access using a special wireless adapter for

your notebook or handheld. Check with each to find out its specific hardware requirements. Unfortunately, coverage areas and pricing may make some services unusable in certain geographic areas.

ARDIS. ARDIS (<http://www.ardis.com>) has perhaps the greatest coverage area of all the wireless data carriers. Check out its Web site to view coverage maps and its available services. Most of its coverage centers around metropolitan areas, so you won't get continuous access while driving across the country. ARDIS uses a packet-switched technology and presently can handle connections up to 19.2Kbps. (Packet switching is the process of breaking down a transmission over a network into smaller parts called packets and then splitting them up as they travel to their final destination, with each one taking the fastest possible route.) Based on the X.25 protocol (a standard for packet-switching protocol on local-area networks), ARDIS is an analog system, unlike the digital systems in use by Ameritech Cellular, Bell Atlantic Mobile, and MetriCon.

Ameritech Cellular. If you live in the Midwest, then you can choose one of two wireless services from Ameritech Cellular (<http://www.ameritec.com>). You can use Ameritech's CDPD or circuit-switched wireless data network. Connection throughput of up to 19.2Kbps is available through Ameritech using its CDPD network.

Bell Atlantic Mobile. Bell Atlantic Mobile (<http://www.bam.com>) offers extensive coverage along the Atlantic coast and has coverage deals with other cellular providers (such as Ameritech) across the country. Bell Atlantic is a CDPD-based wireless network so its speeds top out at about 19.2Kbps.

MetriCon. Perhaps the fastest access to a wireless data network is through MetriCon (<http://www.metriCon.com>). Boasting speeds up to 33.6Kbps, you can surf the Web, log on to your corporate network, access server-based data files, and send E-mail messages efficiently with this network. Only select areas of the country, however, have this

service. It is currently only in the Seattle, Wash., San Francisco, and Washington D.C. areas, because of the nature of the MetriCon network.

Called the Ricochet Network, this digital packet-switched network has a small shoe-box sized radio transceiver spaced about every half mile on street lights and utility poles. For every 100 radio transceivers, there is one Wired Access Point (WAP) that converts the radio signals into standard Transmission Control Protocol/Internet Protocol (TCP/IP) on a frame relay network. This frame relay network serves as the transport to get your wireless data back to the corporate network or your ISP.

Fixed Wireless Access

So far, we've covered mobile wireless Internet connectivity. There is, however, another segment of wireless network connectivity that we have not looked at yet: high-speed wireless networking. High-speed wireless networking is available from a handful of vendors that provide both building-to-building and short-range mobile connectivity. Ranging from two megabits per second (Mbps) to 10Mbps, fixed wireless access allows you to work at a higher speed, but will cost you in terms of mobility.

Fixed wireless access, unlike mobile wireless access, is an extension of an existing Ethernet (a local-area network protocol) network and isn't for use on the move. These fixed network extensions are a permanent fixture, providing high reliability and fast data throughput between buildings or to a conference room's ad hoc wireless network.

In many instances, using fixed antennas to connect two buildings is more cost-effective than laying down a physical connection. In some cases, wireless is the only alternative you have. For example, you may need to provide local-area network (LAN) connectivity between two buildings in a downtown

historic area. You can not run a physical connection, such as standard copper or fiber optic cable, between the buildings because of the location. Instead, you can use a pair of 10Mbps wireless bridges, such as the Campus BridgeLINK by RadioLAN (<http://www.radioLAN.com>), to make the wireless connection. Your network users can't tell the difference and connection speeds run at normal wire-speed.

You can also create a temporary wireless network between laptop users using smaller versions of the fixed-antenna solutions. You can use a wireless PC Card network adapter that will allow you to create a peer-to-peer network using Windows built-in networking. Some products also allow you to connect your laptop to the company network backbone using yet another smaller fixed-antenna device. While you do have some freedom of motion, range is fairly short—in the neighborhood of 300 feet or so.

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by Keith Schultz and Kimberly Maxwell

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74643

Compiled by Jeff Dodd & Joel Strauch

Graphics

1001 Free Fonts

<http://www.1001freefonts.com>

We should point out that not all of these fonts are free. But, then again, even if you have to pay for some of the fonts included here, 1001 Free Fonts is still one of the best places to find fonts for your PC. The site catalogs fonts alphabetically, with a special section for new fonts as well as dingbats (symbols, as opposed to alphanumeric characters). The site also features a few free font utilities.

A+B+C GRAPHICS

<http://www.abcgiant.com>

An all-in-one repository of downloadable graphics, A+B+C GRAPHICS features backgrounds, three-dimensional (3-D) objects, buttons, fonts, banners, arrows, and bar lines. The site also offers hyperlinks to related sites and, as an added—but anomalous—bonus attraction, it contains a searchable database of more than 30,000 technology jobs.

Absolute Background Textures Archive

<http://www.grsites.com/textures>

Billing itself as the largest collection of free background textures on the 'Net, this site offers more than 2,800 textures that can be seamlessly tiled to create a background for your Web pages. The site groups the textures by color and pattern, so it's easy to find one you like. The site also offers a collection of borders and an archive of graphics that complement the various background textures.

Animation Factory

<http://www.animfactory.com>

The Animation Factory, with its collection of more than 11,000 animated graphics, is a must-see site for anyone who wants to add spirit to a Web page. The site arranges its animated graphics

into a dozen categories, including Alphabets, Characters & Creatures, Flags, International Languages, Music, Sports, and Transportation. Visitors can send most of these graphics as electronic postcards. Best of all, they are free for non-commercial use. If you want to incorporate the graphics into a business-related site, you can join the Animation Factory Premium Gold Site for a rate of \$29.95 per year.

ArtToday

<http://www.arttoday.com>

ArtToday provides two collections of downloadable graphics. The first collection contains 40,000 free graphics and is open to all users. The second collection contains more than 750,000 images and is open only to subscribers who pay a \$29.95 annual fee. We previewed the free collection and found more than enough downloadable graphics to satisfy the needs of the average home and small business publisher. For example, the site's free collection included 195 icons, more than 3,000 backgrounds, and 460 bullet list symbols. ArtToday also provides thousands of dividers and animated graphics.

CoolText.com

<http://www.cooltext.com>

This online graphics generator allows you to devise and download customized logos, buttons, and bullets with a few mouse clicks. Simply select a design; enter the desired text; specify size, colors, and font; and click the Render button. The finished product will appear on-screen within seconds.



Digital

Producer Magazine

<http://www.digitalproducer.com>

Few graphics-related resources can offer as much information or as many tools as Digital Producer Magazine. This megasite provides news from the graphics industry, feature articles, hardware and software reviews, graphics freeware, message boards, and tutorials for creating graphics. The site also features an impressive gallery of downloadable graphics, animations, and 3-D images, as well as links to contests where you can win graphics software.

Free Graphics

<http://www.freegraphics.com>

The Free Graphics directory points the way to hundreds of sites offering free images, wallpapers, fonts, animations, backgrounds, software, and more graphics goodies. The site also features special sections for holiday graphics, artist contests, and tutorials for creating your own graphics collections.

Yahoo! Image Surfer

<http://pix.yahoo.com>

The Yahoo! Image Surfer is one of the few sites offering a sizeable collection of free photographs that you can use in your online and desktop publishing projects. The collection includes thousands of thumbnail images in six categories: Arts, Entertainment, People, Recreation, Science, and Vehicles. You also can search through the collection by entering keywords into the search utility. When you find an image you like, simply click it to access its full-size counterpart.

Share The Wares

Some of the best apples in the online orchard are the free (or free to try) programs available for download. Each month we feature highlights from our pickings.

PowerFAQ

Have you ever looked through a list of frequently asked questions (FAQ)? Were you pleased to find the answer to your question without having to venture any further? These online Q&A sessions are one of the best sources of information for computer users. If you run a business and your employees spend most of their time on the phone responding to customer queries, consider setting up an FAQ of your own.

With Right Now Technologies' PowerFAQ, it's simple to set up your own full-time customer-support center. This shareware lets you create a FAQ on your Web site that will dynamically learn and grow as more questions are answered. This 1.2 megabyte (MB) program will work

with Windows 95/98/NT and can be downloaded from the PowerFAQ site at <http://www.powerfaq.com>. It's free to use for 30 days (or forever, if being used non-commercially). After the initial 30 days, a two-year commercial license fee costs \$995.



PowerFAQ learns the right answers for your customers.

BS/1 Small Business and Professional Accounting

Available in both a small business and a professional version, David Business Systems' accounting software can take some of the numbers crunching off your back. The small business edition contains accounts payable, accounts receivable, and general ledger applications (the professional edition also includes a time billing application). The launch pad for both programs takes up little space, and after you select an individual application

from the dropdown-menu, the toolbar displays icons for that ap's most often used options.

The shareware versions of both editions, roughly 3.5MB in size, are available for Win 95/98/NT from David Business' Web site (<http://www.dbsonline.com>). Users can conduct up to 100 transactions of each type before registration is required at \$35 for the small business version and \$50 for the professional.

That's News to You

Finding the appropriate Usenet discussion group to match your interests can be a monumental task, so each month we scour the tens of thousands of newsgroups out there and highlight the ones that delve into popular topics. If your Internet service provider (ISP) doesn't carry these groups, ask it to add the groups to its list. This month we've selected the field of investing.

Alt.invest. If you're looking for general investing help or advice, this is the group to hit.

Alt.invest.penny-stocks. Looking to take a bit more risk on the low-end? This busy group is dedicated to the up-and-down world of penny stocks.

Misc.invest.mutual-funds. On the other hand, if you're searching for a more stable investment, read up on the best mutual funds to find.

Quick Fixes

Most of today's software and hardware can benefit from a few updates, patches, and add-ons downloaded from the Internet. In anticipation of the Windows 98 upgrade that will find its way to store shelves later this year, we'll show you how to update the operating system (OS) by yourself at no cost.

Microsoft's Site

This is the official Windows 98 (Win98) upgrade site by Microsoft. You'll find links to the latest version of Internet Explorer, the year 2000 (Y2K) update, security upgrades, and the Windows Update page (see below).

<http://www.microsoft.com/windows98/downloads>

Microsoft Windows Update

If you're ready to put yourself in Microsoft's more than capable hands, visit its Windows Update page. This site will examine your OS and see what updates are available. It will even automatically download and install updates for you.

<http://windowsupdate.microsoft.com>

WinFiles

This collection of shareware for Win98 is an excellent resource for themes, utilities, Internet and network files, and much more.

<http://www.winfiles.com/apps/98>

Compiled by Michael Sweet
Graphics & Design by Lori Garriss
& Fred Schneider

Making Waves Online

The Internet's explosive growth in the mid-1990s created a feeding frenzy by introducing the smell of big money into the online ocean. Established companies jumped into the water to join the scores of new ventures spawned there. Today a handful of big fish have evolved and carved out influential positions in the 'Net power structure.

Some of these companies work in the background, providing the Internet's infrastructure. AT&T and MCI, for example, provide the essential phone and cable lines, while companies such as Oracle provide the software that powers many Web sites. Though these companies are ever-present, their influence isn't apparent to the average user swimming the online waters.

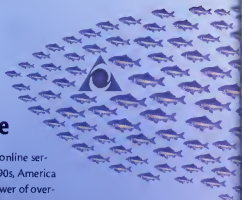
Anyone who has spent time on the Web, however, is familiar with a handful of high-profile companies shaping the course of the online future. These pages provide an overview of some of the online ocean's leading leviathans.

Microsoft

Microsoft stumbled out of the blocks when the Internet's popularity exploded a few years ago. But the company (<http://www.microsoft.com>) changed course with surprising speed and pursued an Internet-centric agenda. It has more than made up for lost ground by gobbling up well-known online enterprises such as free Web-based E-mail pioneer Hotmail and the company that popularized television-based surfing, WebTV. Microsoft's Internet Explorer (IE) browser also has taken a huge bite out of the market share of once-dominant Netscape Navigator. In the corporate market, for example, IE has taken the lead, with 59% of companies using IE compared to 41% using Navigator, according to a Zona Research study released in May 1999. In October 1998, IE trailed Navigator's share by 20 percentage points in that same market.

America Online

As the clear victor of the online service war waged in the mid-'90s, America Online (AOL) enjoys the power of overwhelming numbers. Everyone in the online sea recognizes the powerful presence of AOL's 17 million members and the audience of its site at <http://www.aol.com>, which was the Web's most popular in March 1999 (31,435,000 unique visitors, according to Media Matrix). AOL strengthened its hand in 1998 with the acquisition of Netscape (<http://www.netscape.com>), creators of the Navigator browser and proprietor of one of the most popular Internet portal sites.





Compaq

Though some people surf the Web using set-top boxes and televisions, most people reach the Web through PCs. Despite a few financial waves in early 1999, Compaq still rates superpower status as the world's second largest PC manufacturer. The company is stretching its influence beyond the basic PC hardware arena, most notably through the acquisition of server maker Digital Equipment Corp. and its popular AltaVista search engine (<http://www.altavista.com>). That means in addition to providing a

large share of the PCs used to access the Internet, Compaq also provides companies with the hardware to run the sites and assists people trying to find their way on the Web.



Yahoo!

If you Yahoo!, you're not alone.

Yahoo! (<http://www.yahoo.com>) is the world's most-recognized Internet brand and is consistently one of the Web's most-visited sites. Yahoo! is constantly expanding its huge online presence by offering free E-mail service, online shopping, mapping services, and more to its visitors. Its purchase of broadcast.com (<http://www.broadcast.com>) in early 1999 gave Yahoo! a stake in the growing business of delivering audio and video content over the Internet. This year the company also bought Geocities (<http://www.geocities.com>), which is an online community of about 4 million "homesteaders" with personal Web pages at the site.



Disney

This is no Mickey Mouse operation. Disney greatly expanded the Internet portion of its sweeping media empire when it and Infoseek (of which Disney owns 43%) collaborated to create the Go Network (<http://www.go.com>), an Internet portal site leading to Disney-owned content and more. The "members" of the Go Network are big names such as ABC.com, ABCNEWS.com, Disney.com, ESPN.com, Family.com, and MrShowbiz.com. The Go Network, already one of the most-visited sites on the Web, should expand its reach as Disney throws more of its multimedia muscle behind it.



E-commerce

Online sales represent no small treasure trove. According to Giga Information Group, E-commerce sales hit about \$47 billion in 1998, with \$37 billion representing business-to-business sales and another \$9 billion coming from business-to-consumer sales. Giga expects E-commerce sales to reach at least \$580 billion by 2002, possibly going as high as \$970 billion.

Need help with your hardware or software?
Looking for simple explanations on technical subjects?
Send us your questions!

Windows 95/98:

Q: Your article on "Creating & Using Bootable Diskettes" ("Basic Training," December 1998 issue) gave me all the information I need to know except how to get my Windows 98 back up and running. When I tested the diskette, I got to a DOS prompt and no further. What do I do then?

A: It's not us that left you high and dry, but rather Windows 95 (Win95) and Windows 98 (Win98). Contrary to its name, the Win95 or Win98 startup disk will not fully restart Windows. What the startup disk does is get you to a DOS prompt. If Windows itself is in a more-or-less normal state you might be able to start it by typing `win` at the prompt and pressing ENTER. However, if Windows was running normally, you probably wouldn't be using the startup disk anyway.

Someone with basic DOS knowledge can often do some fixes from the DOS prompt. If you read the file on your Win98 system called `C:\WINDOWS\COMMAND\EBD\Readme.txt`, it'll give you quite a few things you can try at the DOS prompt. Unfortunately, these tricks aren't exactly easy to perform, and they clearly show why expertise in DOS is by no means obsolete even in this age of Windows.

If Windows stops working, neither you nor a good technician will be able to get it up and running just by using the startup disk. However, from the DOS prompt you can do several important things. First, you can usually copy critical data files from your hard drive to diskettes or other external disks before they completely disappear into never-never land. Second, you may be able to get the CD-ROM drive running so you can use the Win98 installation CD to reinstall Windows.

Computer Hardware:

Q: I figured I could save a little money by building my own PC, but when I added up the parts, it didn't look as if I'd save any money. How can that be? It has to cost something for the manufacturers to assemble a computer. Is there some way I can really do it cheaper?

A: Very rarely. You could save some money if you already own some of the major parts, such as expensive hard drives or an expensive CPU. However, if you make a mistake and burn up any parts, or have to pay full retail for software (such as the operating system) that otherwise would come with a retail system, it may cost you more. On the plus side, you might have some fun building your own PC, and you might learn some useful skills. Of course, you might also learn all the reasons why you wouldn't recommend it to your friends.

The reason you can't save much money by assembling your own PC is that the technicians at a factory have building experience, and they build the same machine all day. That means they can assemble one in about 20 minutes, and for their time the manufacturer pays them about \$40. Since the manufacturers buy parts in volume, they get them for less, and in the end they save at least the \$40 it costs to pay an expert to assemble the computer. That doesn't even account for the possible snags you can hit along the way, as well as the time it takes to do the job right.

For example, say the CD-ROM drive doesn't work the first time around. You then have the very difficult and time-consuming task of figuring out whether the CD-ROM drive is defective or if perhaps some obscure software setting or driver is off. In a factory situation, the technician simply grabs another CD-ROM drive from the shelf, shoves it in, and in a few minutes knows whether the problem was in the drive itself or elsewhere.

Here's something else to consider: It could take a home PC builder about four hours to install and fully configure Windows software and a standard office suite even if there are no unexpected detours. In the factory (where every PC gets software that the company has tested for compatibility), experts can fully install a software environment onto the hard drive with a high-speed duplication process that takes less than 10 minutes, and comes out perfectly configured every time.

In the end, it costs about the same to build your own PC as it does to buy one, and that's in a best-case scenario. Building your own PC can be a good thing, but not if your only goal is to save money.

*It costs
about
the same*

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as it does to buy one.

Q: *When I shut down Win98 but leave my computer running, the hard drive doesn't power down (stop spinning) after Win98 says "It's Now Safe To Turn Off Your Computer." I believe this is a software-related problem, perhaps caused by my Norton AntiVirus, but I disabled the auto protect, and there was no change. I also tried every software- and BIOS-related setting I could think of and it still happens.*

A: We think you're on the right track with your suspicion of Norton AntiVirus. If it's version 5.0, we may have your cause and cure: Version 5.0 shipped with several shutdown problems, and you can find the fixes at the Symantec Web site at <http://www.symantec.com/us.index.html>.

Another option is to search the Registry for the area called HKEY_LOCAL_MACHINE\System\CurrentControlSet\control\Shutdown\Exclusion List and to delete the NAVEX entry.

In fact, anytime you have a device that doesn't shutdown when it should, you can try searching the Windows Registry for entries that end with "Shutdown\Exclusion List," because basically those entries tell the PC to exclude the device from the normal shutdown procedure. (NOTE: Don't mess with the Registry unless you're familiar with it, and you should always make a backup copy first. You can do very good things in the Registry, but you can also make a real mess of your computer if you don't know what you're doing.)

Q: *I have a 5.25-inch diskette drive as my A: drive and a 3.5-inch as my B: drive. I need to permanently change the B: drive to the A: drive for booting purposes. How do I do it?*

A: Making the smaller drive the A: drive, the bootable drive, is a good idea because nobody ships software on 5.25-inch diskettes anymore, and you may find it difficult to install some software from the B: drive.

It is simple to reverse your drives. Open the case and find the one flat, gray, 1.5-inch-wide cable that goes into the back of both diskette drives. There are two sockets on the end of that cable, one connected to the A: drive and the other to the B: drive. Take the socket connected to the 3.5-inch drive and connect it to the 5.25-inch drive, and vice versa. (NOTE: Be sure to note which edge of the cable has the thin red strip on it and where each drive was pointed before you swap. Keep the plugs in that same orientation.)

Now restart your computer and get into the CMOS setup screen. You do this on many computers by

holding down the DELETE key while the computer starts up. In CMOS, find the setting that currently says drive A: is 5.25 inch and/or 1.2 MB and the similar setting that says drive B: is 3.5 inch and/or 1.44MB. Reverse these settings.

Some newer computers let users switch the boot order (again by going into BIOS/Setup), which would let you skip opening the case. If you have your 5.25-inch drive set as A:, it's probably safe to assume you have an older system that doesn't provide this option. If it does, you can use it with one caveat: Although B: would let you boot your system from a Win95/98 Startup diskette on a 3.5-inch diskette or other bootable diskette, note that some Windows routines (notably the Add/Remove software routine) will still be looking on A for software.

If you go this route, be careful not to confuse a BIOS option for boot order with the one that sets the size of the A: and B: diskette drives. The B: bootable route only works if you find a BIOS option that lets you set B: to be a bootable drive.

Also, don't try using the set-diskette-size option in the BIOS, telling the BIOS "My A: is now 3.5-inch and my B: is now 5.25-inch," without first swapping the cables. If you do, it gives bad information to the system about the size of A: and B:, and that option does not make B: bootable. If used without cable swapping, both diskette drives will simply fail to operate.

Q: *Is it true that only 24X and faster CD-ROMs can read disks created with CD-RW drives?*

A: No. Normally discs recorded with the compact disc-rewritable (CD-RW) drive, whether done professionally or on your home computer, should work just as a normal disc in most respects. The only possible exception may be in the area of longevity. These discs may not possess the long-range stability of commercially recorded discs, so they may not work as well in a few years.

Q: *I am a computer teacher in a school, and I have been asked to connect a Pentium computer running Win95 to a television in my*

**CD-RW
discs** may not
possess the long-range
stability of commercially
recorded discs.

computer lab. I need to know what I should look for when purchasing a television for this purpose. I have a connector called TVator. I would like to use a television with a 32- or 36-inch screen so my students can view it from anywhere in the lab. My problem is that I don't know whether I need to purchase a television with special features in order to set up this configuration.

A: You really don't need much in the way of special features; almost any set will do. What may be a bigger issue is that your TVator card, as with many such cards that send computer screen images to a standard television, offers a maximum resolution of just 800 x 600. This is good enough for general viewing, but if you want to run your computer display at a higher resolution, the TVator can't handle it. Even worse, TVator requires you to slow the refresh rate on your computer monitor down to 60 hertz (Hz). Hertz measure a monitor's refresh rate, which is the number of times per second the video card redraws the monitor image. The 60Hz rate is slow, and it can create a flickering image that causes eye fatigue and headaches in some computer users. Most standards of ergonomics suggest a refresh rate of at least 75Hz. The 60Hz-rate will bother you more when looking at the monitor than when looking at the image on the television screen because the phosphors (chemicals) inside TV screens hold the image between redraws.

As for the television, it would be helpful if it had a video input jack, sometimes called a monitor jack. If your television comes without such a jack you can probably get an adapter that lets you connect through the antenna connector. Also, there is a slight advantage to buying a television that offers high resolution because the higher the resolution, the sharper the image. Neither regular TV broadcasts nor the TVator itself will take advantage of a very high resolution television, but someday you may want to connect a digital video disc (DVD) drive (either in your computer, or as a separate player) into the television, and this technology can take advantage of the higher-resolution.

(NOTE: TVator is from Antec. Product information is available at the company's Web site at <http://www.antecinc.com/products/multi/multi.html>.)

Online Communications:

Q: *I'm going to be traveling to Europe this year and want to stay in E-mail contact. I've considered getting an E-mail-capable PDA or a notebook computer. I have two general questions. What hardware do you recommend? How do I get my ISP to forward my E-mail?*

A: Whether a personal digital assistant (PDA) is sufficient computing power for you we can't say. As an E-mail tool, it's not ideal if you expect to receive messages with file attachments. If, however, you don't want to spend the money for a full-sized notebook computer, you could also consider a less-expensive handheld PC (HPC) with Windows CE. These devices are a compromise between the small but somewhat limited palm-sized devices such as the Palm III from 3Com, and a capable but big and expensive notebook computer. Many of the new HPCs look about the same size as some of the mininotebooks on the market, but they differ in important ways.

On the plus side, an HPC typically offers a much longer battery life (typically 12 hours instead of two hours.) Also, they have no hard drive to fail as they store everything in static RAM. That means when you switch a Windows CE computer back on it, everything is exactly where you left it, even if you didn't save the document.

On the downside, HPCs run less-powerful programs (they come with "pocket" versions of Microsoft Office programs), and you can't just load any new, off-the-shelf program you want. It has to be a CE-specific program to work.

As for the Internet service provider (ISP) problem, most ISPs will forward your E-mail to any address. This is good because most ISPs in the United States do not have European telephone numbers for you to use. CompuServe and AOL are exceptions.

You should also consider opening a free Web-based E-mail account with a service such as Hotmail (<http://www.hotmail.com>) or Yahoo! Mail (<http://www.yahoo.com>). You can have your current E-mail forwarded to one of these Web-based addresses for access overseas. Although reading and writing E-mail in a Web browser isn't as fast or elegant as with the average software E-mail client, there are advantages for the traveler. With a free, Web-based E-mail account, you can access your messages from any computer that has an Internet connection and a Web browser.

That means when you come across one of the cybercafes that exist in most European cities, or you visit a friend or colleague with an Internet connection, you can access your messages. Even if your ISP does have access in Europe, dialing-in can be a pain while on the road.

Most standards of
ergonomics suggest a
**refresh
rate**
of at least 75Hz.

Besides finding the correct number for the country you're in, you also must have the appropriate adapters to connect your equipment to a European phone line.

Word Processing:

How do I make a hard space in Word for Windows? I looked all through the help screens and couldn't find out how.

Q:

A:

We're guessing that by hard space you mean a space bar character that doesn't wrap at the right margin. These can be handy, especially when typing technical stuff such as computer commands, where a space at the margin can push the rest of the command to the next line, making it unclear whether the command needs a space there to work properly.

The problem with computerized help systems is that you have to use the same terminology they use in order for them to help you, and in Word, what you call a hard space is called a "non-breaking space." You'll find the information in the Help file, but you have to know how to look for it. Anyway, to get a hard space, hold down the CTRL key, the SHIFT key, and then press the Spacebar.

Q:

I finally converted to Microsoft Word after using AmiPro for years. Unfortunately, I now have almost a thousand old AmiPro files, many of which I may want to use or refer to in the future. Word 98 will read about 18 types of files, but not AmiPro files. I can get them over into Word through the tedious process of having my old AmiPro save them one at a time into Word For Windows 2.0 format and then letting Word import them because it has no trouble reading that. Is there any other way to do this?

A:

Your question also applies to folks coming from other older word processors that have no obvious converter available in Word.

Your approach will work, but as you say, it is tedious. You could buy a commercial file format converter utility and convert all your files at one sitting, or you can just leave them in the AmiPro format and teach Word how to import them as needed. Microsoft makes free, supplementary converters that enable Word to read and write in many less-popular file formats such as Windows Write 3.0 or 3.1 (Write32.cnv), Lotus Ami Pro 3.x (Ami332.cnv), and WordStar 3.3-7.0 for MS-DOS. For more information, visit the Microsoft Web site at <http://officeupdate.microsoft.com/downloadDetails/wdsupcnv.htm>.

Q:

Our new principal believes that nobody uses WordPerfect anymore and is leaning toward not allowing us to teach it at our high school. Currently, we teach Microsoft Word and WordPerfect. She has asked us to research the issue. We intend to call businesses and industries in our area. I also remember an article in your magazine addressing this issue, but I can't find it. Can you help us?

A:

While it's a bit strong to say "nobody" is using WordPerfect, it is true that the vast majority of people are now using Microsoft Word.

Although WordPerfect and WordPro are formidable programs, when a business hires someone new or a temporary employee, chances are these people will have experience using Word, not the competition. This is yet another reason for businesses to migrate toward Word. That means training programs such as yours need to shift to Word.

Given Word's current momentum, it is very difficult for any competitor to have much chance of grabbing market share from Word without inventing something radical. (Perhaps a word processor that would read your mind and write for you would have a chance.)

Despite a few significant differences, there are more similarities among the current word processing programs than differences when it comes to basic functions such as typing, inserting, deleting, cutting, pasting, centering, saving, and opening files. The differences become much greater when you get to advanced features such as mail-merge, moving frames, manipulating graphics, and converting documents to Web pages.

If you are only training your students in the basics of either Word or WordPerfect, their skills should transfer between packages fairly well. ■

*It is very difficult
for any competitor to have
much chance of grabbing
market
share
from Word.*

Get straight answers to your technical questions. Ask *Smart Computing*. Send your questions, along with a phone and/or fax number so we can call you if necessary, to: Smart Computing Q&A, P.O. Box 85380, Lincoln, NE 68501 or to editor@smartcomputing.com. Please include all version numbers for the software about which you're inquiring, operating system information, and any relevant information about your system. (Volume prohibits individual replies.)

Answers to users' most common questions.

Downloading & Installing Files

FAQ: *Where do I find files to download?*

You can find files all over the Internet. Software and hardware manufacturers often post patches (programming codes that temporarily fix a software problem) for their products on their sites. Look in the technical support section of a Web site for updates and device drivers. Many companies also offer fun or useful freebies for download. Plus, there's shareware and demonstration programs you can try before you buy. Also, you can download multimedia components that let you hear audio or view video clips on the Internet.

Some popular places to find downloadable files are Download.com (<http://download.com>), Microsoft (<http://www.microsoft.com/msdownload>), DownloadStore.com (<http://www.downloadstore.com>), and Softseek (<http://www.softseek.com>).

FAQ: *How do I get them?*

Downloading files is pretty easy to do. Usually, it's just a matter of clicking a link that corresponds to the file you want to download. When you click the link, a dialog box should open, asking if you want to open the file from its current location or save the file to disk. Usually, it's best to save the file to disk, specifically the hard drive. Choose that option and click the OK button at the bottom of the dialog box.

A file description of some sort frequently accompanies downloadable files. Read it. There are certain instances, such as when you download a patch for a software program or update for a piece of hardware, in which you need to make sure you download the appropriate version of the file. If that's the case, it should be clearly stated somewhere in the file description. Special instructions and other information, such as the file size and estimated download time, may also appear in the file description. Make sure you always download the exact version of the software you need.

FAQ: *Where do I put downloaded files?*

The best place to store the files you download is in a specific folder on your hard drive.

Creating a Downloaded Files folder on your hard drive lets you store all your downloaded files in one place, making them easy to find and install.

After you create this folder, you're ready to go. Remember the dialog box from the previous question? When you click the OK button telling your computer you want to save the file to disk, the Save As box will open. Find the folder in which you want to save the file, double-click it to open it, and click the Save button. The file downloads and saves to that folder. You can rename the file if you want. Just make sure you don't forget where you saved the file.

FAQ: *Now that I have downloaded it, how do I install it?*

Installing a file once you've downloaded it doesn't take much effort, either. Usually, all you have to do is double-click the file to install it automatically. Use Windows Explorer or My Computer to open the directory where you saved the file. Now find the file and double-click it. The rest should take care of itself. Please note that many files come with installation instructions or a Readme.txt file. You should read these beforehand to see whether there are special installation instructions or procedures you need to follow. Chances are there won't be, but it's always a good idea to find out first.

You should also consider backing up your Registry and critical system files before installing a file you downloaded, just in case something goes wrong. Also, have your antivirus software ready to go, just in case you download more than you bargained for without realizing it.

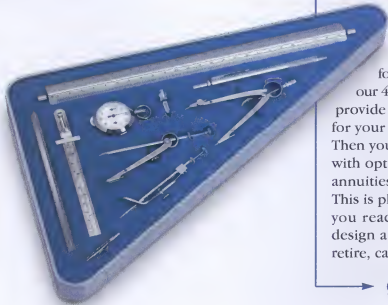
Occasionally, a file may be installed automatically. This is the case when you download additional components for Windows 98, for example. Certain plug-ins and multimedia enhancements for Web browsers may also install themselves, but you'll probably have to close and re-open your browser.

FAQ: *What if the item I want to download is "zipped"?*

Many files are zipped (compressed) to allow faster downloads. However, if you download a zipped file, you'll need a special program to unzip it. There are many zip utilities out there, with the most popular ones being PK Zip for Windows (<http://www.pkware.com/>), WinZip (<http://www.winzip.com>), and ZipMagic 98 (<http://www.mijenix.com>). These programs convert the zipped files into files you can install on your computer. ■

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When you need help resolving computer service problems, bring your questions to Action Editor.

Intellection Goes AWOL



In May 1998, I ordered WinDoublor software from Intellection Inc. as part of an offer that included a free copy of CompleteDelete. I received WinDoublor a couple of weeks later, but it did not come with instructions or CompleteDelete. I phoned the company's toll-free number, and a representative told me someone would call me back. A representative never contacted me, and when I called the toll-free number again in August of 1998, the number did not work. Then, I contacted the Better Business Bureau of Des Moines, Iowa, but they were of little help. Can you help me get the rest of the products I was promised?

JOHN WOODROW
FORT PIERCE, FL

It looks like John won't be getting his missing software and instructions. Based on our contact with the Urbandale, Iowa, City Clerk's office and the Texas Attorney General's Press Office, and extensive research on the company, we've concluded that Intellection Inc. is no longer in business. (NOTE: Intellection's main office was in Dallas, but supposedly it had an office in Urbandale, Iowa.) The phone company has reassigned the company's toll-free number, and its fax number is no longer in service. We attempted to contact Tom Coleman, the CEO of Intellection Inc., but his telephone number was also disconnected.



I purchased a desktop CTX computer (LP11233-BB) in Davenport, Iowa, in January 1998. In addition to various other problems, when the computer "sleeps" for any length of time, the device manager literally "empties" itself. This emptying process causes error messages to occur and programs to not open—let alone run. Upon rebooting (either cold or warm), all items reappear in the device manager and everything returns to normal for the time being.

In an effort to get these problems resolved, I have shipped the system unit to CTX International in Walnut, Calif., six times in the past year. CTX claims it has replaced all components with "refurbished" parts, and yet the problems remain. I have requested that the company acknowledge the "lemon law" and send me a new computer, but for some reason CTX refuses to do this. I have

filed complaints with two southern California Better Business Bureau offices as well as the California Attorney General's office, which has investigated this matter to no avail thus far. Can you help us resolve this problem?

RICHARD AND PAT FULLER
MT. CARROLL, IL

We received this message from the Fullers in January 1999, one year from the date of their original purchase. Since then, they have made weekly, and often daily, efforts to resolve the situation. When the California Attorney General's office asked CTX about the Fullers' case, CTX responded that the Fullers' PC was in CTX's repair shop and that CTX would ship it by Nov. 20, 1998, if it passed CTX's "quality control check without any problems." Apparently, it did not meet the appropriate standards because the Fullers didn't receive their PC. Finally, the Fullers requested a refund, but were told that the company's president declined to authorize a refund. They finally reached an agreement with CTX to have a completely new computer with processor and RAM upgrades (compared to their original PC) built and shipped, but it displayed the same problems as the original PC. The Fullers have continued to meet with delays and broken promises in getting a working PC.

We have spoken to two people at CTX throughout this saga. A Dr. James Rocket seemed sincerely concerned and helpful, but in mid-May CTX informed us Dr. Rocket was no longer with the company. The other representative we spoke with was unresponsive and rude and hung up on us on one occasion. Repeated attempts to contact a third person, who is assigned to the Fullers' case, have met with no success. This third party does not take our calls nor return our messages.

As of this writing and more than 18 months from the date of their original purchase, the Fullers still have not received the new computer CTX promised them. CTX appears to have shown a total disregard for the Fullers as customers, as well as a lack of desire to cooperate with us or even the California Attorney General's office. We will continue our efforts on the Fullers' behalf and hope to report soon that CTX resolved the situation. ■

Are you having trouble finding a product or getting adequate service from a manufacturer? If so, we want to help solve your problem. Send us a description of the product you're seeking or the problem you had with customer service. In billing disputes, include relevant information (such as account numbers or screen names for online services) and photocopies of checks. Include your phone number in case we need to contact you. Letters may be edited for length and clarity; volume prohibits individual reply. Write to: Action Editor, PO Box 85380, Lincoln, NE 68501-5380. Or Send E-mail to editor@smartcomputing.com. Or fax us at (402) 479-2104.

analog-to-digital converter (ADC)—

A device that converts an analog signal into digital data so an analog device can retrieve the data.

Basic Input/Output System (BIOS)—

A special piece of software built into most computers. BIOS routines control the start-up process of the machines and other basic functions such as the keyboard, display, and disk drives.

C—A high-level programming language developed in the 1970s. C is a compiled language containing only a small number of built-in, machine-dependent functions. The majority of functions are machine-independent, which means they are not linked to a particular computer. Machine-independent functions can be used on different computers with little or no change.

CD-recordable drive (CD-R drive)—A

drive that can read and write to CDs, letting users create their own CD-ROMs. Unlike the CD-rewriteable format, these discs, once recorded, can't be erased and reused, although users can store the information in numerous sessions (if the disc is not full).

CD-rewriteable (CD-RW)—A CD

format that allows users to erase and reuse the CD. CD-RWs have a 10-year life span and users can overwrite them 10,000 times. CD-RW drives can play and write to discs and retrieve information from CD-ROMs.

charge-coupled device (CCD)—An in-

strument with its semiconductors arranged so the output (electrical charge) from one semiconductor is the input of the next semiconductor. This type of array is used as the light-detecting component in many digital cameras, video cameras, and optical scanners.

complementary metal-oxide semi-

conductor (CMOS)—An electronic component used for RAM and fast data switching.

database (DB)—A collection of re-

lated information in an easily accessible format such as a table, form, or report. Databases can contain anything from address lists to PBA bowling schedules.

dots per inch (dpi)—A measure of

printer resolution that indicates how many ink dots the printer can place in one square inch. The larger the dpi, the sharper the printed image.

handheld computer—A PC held in

the palm of a user's hand. Handheld computers include palmtop computers and personal organizers, which run software such as calendars and contact managers.

Internet service provider (ISP)—An

organization that lets users pay a fee to dial into its computers and connect to the Internet. ISPs generally provide an Internet connection, an E-mail address, and perhaps Web browsing software.

latency—The time difference be-

tween when a computer issues a request for data from a storage device and when that device finds and delivers the information.

mail merge—The ability of some

word processing applications to automatically insert a list of addresses and other information into form letters.

parallel port—The computer inter-

face outlet or plug where users can connect an external parallel device, such as a printer, to a PC. This type of port allows more than one bit of data to be transmitted at once.

server—The control computer on a

local-area network (LAN). The server

controls software, access to printers, and other parts of the network. The server is usually accompanied by workstations that share the main system's resources.

Small Computer System Interface

(SCSI)—A standard for parallel interfaces that transfers information at a rate of eight bits per second (bps), faster than the average parallel interface. Up to seven peripheral devices, such as a hard drive and CD-ROM drive, can attach to a single SCSI port on the system's bus.

spam—As a noun, unsolicited bulk E-

mail messages on the Internet or Usenet newsgroup postings sent to large numbers of newsgroups. As a verb, to send copies of the same types of messages.

Technology Without An Interesting

Name (TWAIN)—A standard interface

for scanning equipment. Most scanners come with a TWAIN driver, which allows scanners to work with any software that supports TWAIN. These drivers often allow graphics programs to automatically activate a scanner or other input device.

Universal Serial Bus (USB)—A type of

external bus expected to replace parallel and serial ports. With a maximum transfer speed of 12 megabits per second (Mbps), USB is primarily for low- to midspeed peripheral devices, such as keyboards, mice, modems, printers, joysticks, and some scanners.

Usenet—A giant bulletin board on

the Internet consisting of user news, E-mail, and forums that discuss thousands of topics.

virtual reality (VR)—An artificial,

computer-generated environment in which users interact with the environment and objects in it through specialized input devices such as goggles, headphones, and gloves.

An Open Letter To PC Makers:

WE UNDERSTAND THIS MIGHT BE a bad time to talk; you're obviously busy dealing with sweeping changes such as declining system prices, slipping profit margins, and ongoing Microsoft-related litigation. What executive in this market wouldn't be skittish after seeing what a bad quarter did to poor Eckhard Pfeiffer, scuttled as Compaq's CEO with only a multimillion-dollar severance package to show for it?

But even as these shifting industry tectonics dominate your attention, we urge you to remember glamourless issues such as customer satisfaction and your products' ease of use. Every day seems pivotal in the computer world, but industry changes make today an especially critical juncture on the usability issue. As hardware configurations and pricing plans look increasingly alike, reliability and service could push a company to the top. Our hope is every PC decision-maker would note this situation as clearly as one Compaq executive who told us, "Technology has never been easier to acquire or harder to make work."

Personal computing has always been an environment in which technology comes to market only shortly after the builders find it usable. Anyone who wants to use a PC must accept this scenario, paying retail price for products that are 80% finished. It's like buying a ticket for a seat on an airliner and then being asked to fill in for Chuck Yeager in the X-1's cockpit when you arrive at the airport. At least the ground crew points out that you can download the "service patch" that will repair the navigation system's problems—probably.

We're sure you're aware, however, that a current major industry trend is growing consumer intolerance for this approach. Consultant Donald Norman, speaking at May's Embedded Processor Forum, summarized the mood when he said, "There is a massive change underway fueled by a revolt against complexity and unreliability of the PC."

In other words, we've outgrown the "geeks in the garage" stage where we accept rough products from amateurish companies. Few of today's buyers will wrestle with half-baked products just because they outperform the systems of a few months ago. Increased power has fewer noticeable benefits today, and new generations of computer users want to use the devices without mastering all their parts. Computer buyers now dare to dream of computers and software as reliable as TV sets.

We probably don't have to tell you that most computer products still fall short of this goal. But in case you demand proof, consider one of our recent attempts to post photos online. Our goal was modest: We wanted to scan some pictures and post them to an existing Web site using state-of-the-art technology. The Universal Serial Bus (USB) standard was there to simplify the scanner connection, point-and-click software

would help manage our photos, and a File Transfer Protocol (FTP) utility would let us post photos with just a few clicks. Our USB scanner, at least, came through with a painless scanning process. But clicking Scan Now in the scanner software produced a dialog box that only saves photos in the Tagged Image File Format (TIFF). Only later did we discover the Acquire option would let us use the Joint Photographic Experts Group (JPEG) format we really wanted. We wound up installing software to convert images to the JPEG format.

When we tried to dial up the Web site and transfer photos, the Windows' Dial-Up Networking application failed and kept us off the Internet. It seems the Transmission Control Protocol/Internet Protocol (TCP/IP) features had disappeared for some reason, which meant we had to reinstall that part of Windows 95. That, of course, entails tracking down the Windows 95 CD-ROM. Then the FTP program kept performing illegal operations and shutting down. We reinstalled it and had the same problem, all the while pondering how our televisions and microwaves wouldn't force us into such a game of assembling 30 pieces of a puzzle to finish a simple task. With PCs, piece 10 often slips out of your hand as you're working on piece 22.

We realize the very flexibility of PCs makes such scenarios possible and often precludes the mass merchandising of simple, fixed-function units. But there could be a solution in simplifying configurations on lower-end PCs, which less-skilled users are likely to purchase. Or maybe the Internet's remote diagnosis capabilities, currently in their early stages, can relieve consumers of dealing with technical problems. Of course, we don't have all the answers and we don't expect you to. We simply ask that you continue to prioritize the goal of finding a better way to make the power of PCs practical. ■



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